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THE HOUSEHOLD PAINTER

The Household Painter

INTENDED FOR THE USE OF THE HOUSEHOLD, WITH
FULL DIRECTIONS FOR PAINTING, DECORATING,
PAPERING, CALCIMINING, WHITEWASHING,
STENCILLING

WOOD FINISHING, WOOD STAINING, VARNISHING, ETC.
TOGETHER WITH MANY USEFUL NOTES ON THESE
SUBJECTS, AND ON VARIOUS MATTERS OF
INTEREST TO THE HOUSEHOLD MANAGEMENT, THE
WHOLE ACCOMPANIED WITH ILLUSTRATIONS AND
A COMPLETE INDEX TO EVERY ITEM OF
INTEREST

By A. ASHMUN KELLY

AUTHOR OF THE EXPERT SERIES OF BOOKS FOR PAINTERS, DECORATORS,
WOOD FINISHERS, SIGN PAINTERS, ETC.

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PREFACE

TEN years ago the author of this book began publishing technical works for expert workmen and incidently for those ambitious of acquiring some working knowledge of the trades which those works covered. While those books met the needs of practical or skilled workmen, they did little to help the lay worker, the householder, who from time far back has been accustomed to do a little interior decorating, and who today does more than ever, even to the finest kind of work, and with not a small degree of success. At any rate, what they did, or what they are doing, in this manner gives them pleasure and answers their purposes. But they wish to know more about such things that they may be enabled to do better work than heretofore it has been possible for them to do owing to lack of knowledge. I have received many letters during the past few years, or since the appearance of my Expert Series of books, from men in various walks of life, from bank presidents, architects, teachers, mechanics of various trades, and so on, asking for information concerning wood finishing, painting, etc., and it has been a pleasure to reply to their inquiries and to furnish

such information as I could give them. There has been considerable inquiry concerning wood finishing, even though there are published pamphlets or booklets professing to treat these matters fully and free for the asking; evidently these papers, good though they are to a certain point, are not satisfying, they do not give essential details, without which it was and is impossible to do any piece of work.

I have taken considerable pains to make this book capable of meeting the real needs of those who wish to do small, or even large, jobs of painting, etc., and flatter myself that it will be of service to them. Some may incline to the opinion that it is rather too technical for such purpose, but a careful reading of its pages will likely dispel any such idea. There is an absence of the technical, with everything of the plainest exposition. I have endeavored to place myself in the reader's position, and have tried to give him such information, couched in such language, that he may readily avail himself thereof and be enabled to do the thing he wishes to do in the best possible manner. Of course, there will be occasions where he will not get exactly what he is looking for, for his requirements may be out of the usual, and hence not provided for, even though it might be possible to do so, with his case in hand. On the other side, it may be impossible to satisfy his requirements. But of this we are sure, all will find much herein that will meet common needs, and all in plain, understandable language.

This work is carefully indexed, so that any subject you may be interested in can at once be located and used. Each branch of work has its own space, and in several instances is accompanied by useful small notes of practical interest and with illustrations.

Finally, it is not the purpose of this book to either supplant the expert workman, nor to make of the householder who uses the book a competitor. Some one has said that the work of lay mechanics, as I may call them, results in more work for the experts because of the blunders the former will make. I know only of one case of the kind in my own experience, and that unfortunate lady would not have made the blunder she did had this book been in existence. She had boasted she could do as good a job of papering as the writer hereof, but she was mistaken. She pasted the walls first, then hung her paper. After that paper was removed I had the pleasure of doing it right.

There are jobs too small to call in an expert to do. In these days it is impossible almost to get a workman at all. The lady of the house, or the master, will have to do it, and this is the book they will need.

PLAIN INSIDE PAINTING

BARE, unpainted woodwork must first be made smooth with No. 2 sandpaper, and then be dusted off. White pine knots are to be coated with shellac, usually with the white or unbleached kind, to prevent the sap from coming through and staining the paint.

The first coat of paint, called the priming, is to be prepared from white lead, ground in oil, and to be thinned out with raw linseed oil with a little japan drier. This paint must be made thin, mostly oil, so that the oil will saturate the wood and prevent the oil in the next coat from being lost out into the open pores of the wood. Very little drier should be added, say a tablespoonful to the gallon of paint. White lead and linseed oil are both natural driers, hence do not require much assistance. Use a bristle brush for applying the paint, and rub it well into the wood. See that the surface is left evenly covered and smooth.

After the priming coat is dry, say next day, sandpaper it lightly, dust it off, and then apply the second coat. This coat is made rather heavier than the first and may have a little turpentine in it, unless you are to apply three coats on the priming. Add also a little japan drier. Brush it out smooth.

The third coat should have quite some body if it

is to be the last coat. Put no turpentine in it. Three coats give a fairly good finish, yet on new work four coats are much more satisfactory.

After the priming coat is dry, putty all imperfect places, such as nail holes, cracks, etc. For white job better add some white lead to common putty, which will make a white putty that will not show through white paint. Do this putty work neatly. Use a putty knife.

If you wish the last coat to be white then add no oil to the paint when mixing, but use turpentine instead, which will prevent the paint from becoming dark. For very white finish use zinc oxide instead of white lead for the last coat, though equal parts of each of these white pigments will make a very nice white finish.

If you wish to paint white over a dark paint the first coat should be slightly colored, which will reduce the darkness of the old paint, and the second coat will completely cover it.

If you wish to finish in dark or medium shade color, use all oil in mixing the last coat, which will give a glossy effect. Colored paints always look better when done in gloss, while white and very pale tints look better in lusterless effects.

Never mix the last coat of white paint with oil, because it will cause the paint in time to become dark yellow. For the same reason let the last coat be mostly of white zinc paint, and do not use much drying japan.

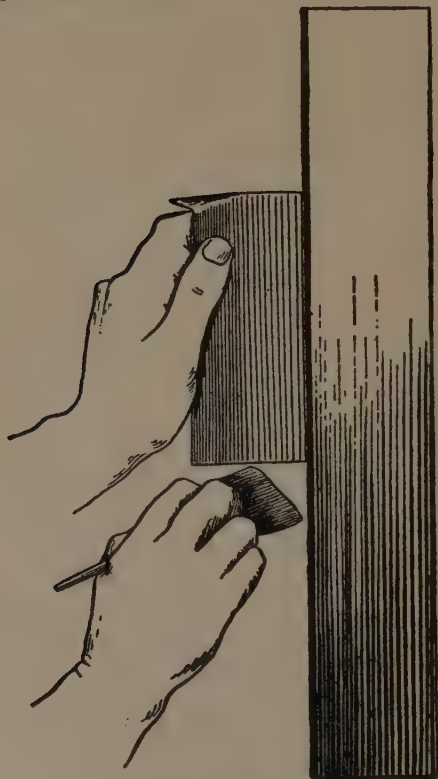
As to the liquids used in interior painting for white finish, turpentine is the best; it tends to bleach the paint, while benzine tends to yellow it. Nor are any of the turpentine substitutes as good, though in many cases they may be employed very satisfactorily. They are much cheaper than pure turpentine, and work easier, hence are handiest for the inexpert.

If you have a room to do, especially the kitchen, first wash all parts where grease may be suspected, such as about door knobs, latches of cupboards, etc. Paint will not dry over grease. Either wash the parts with soap and water or apply strong lime-water, but common soap and water, with a rag, answers very well.

Before commencing to paint over old paint first wash off or dust off the woodwork, for often a good washing off is equal to a coat of paint. Indeed, sometimes it is all that is really required.

If you want to paint the walls, and the plaster is not coated with any preparation, such as paint, water color, etc., nor with paper, first repair any broken places with plaster of Paris and, when set, make smooth with sandpaper. Then apply a coat of glue-water, say two handfuls to a pail of water. It does not have to be very strong; feel it with the fingers by rubbing, and if a little sticky it will do. Coat every part carefully, not missing any. This will be equal to or better than a coat of paint. When it is dry apply a coat of medium heavy paint, two coats usually being enough. Walls are usually fin-

ished in oil or gloss paint. The ceiling may be done the same as the walls.



Using the Paint Shield.

Window sashes are always difficult for the novice. First wash the glass and sash clean, and when dry apply the paint. The paint is mixed as for wood-work in general, or as the room. To prevent the paint

from getting on the glass hold a strip of tin against the glass, close up to the putty, and if any paint succeeds in getting on the glass under the shield it may be removed with a damp cotton rag; use this for any paint that should get on glass while the paint is fresh. Should the paint become dry on glass it may easily be removed with the edge of the putty knife or with a safety razor blade.

There is always a part of a door or window in a room where the painter begins first. The closet he does by doing the inside of the door frame and door, in that order. If there should be any other wood work to do inside, he will do that first of all. Shelves, do the edges first. Base board, do that next. Then the inside of door frame and door; then shut door and commence on the door frame, beginning at the right-hand side, at the bottom, and following the frame to the top and across the top, thence down to the floor on the left-hand side. Then take the outside of the door; do the right-hand side upper panel, go over to the opposite panel, then do the lower right-hand side panel, then over to the other panel. Then do the part that separates the two upper panels, then do the upper part, above the panels, thence down both sides to the lock rail, then do the part that lies between the two lower panels, then do the lock rail, after which finish by doing the remainder of the sides and the lower part of the door. Thus you will see there is an orderly method followed in doing this bit of work.

As to all other doors in a room the same method is followed, only that but one side of the door is done. There is an edge that the door shuts in that must be done first. Then paint the edge of the door next to the lock, then close the door, after which proceed to paint it as directed for the closet door. First do the framework about the door, as directed for closet door.

Having painted all the doors in the room, proceed to the windows, though these may be done before the doors. There is no rule, though painters usually do the windows before the doors. The first move here is to push down the upper sash and paint the sash cord runs. Pull the cord out while you paint under it. Paint the part of the run overhead. Then paint the top edge of the sash. Return the sash to its former or closed position. Then trace-in the molding around the glass, finishing with the framework of the sash. Next take the lower sash, paint its upper edge, then trace-in the molding and frame, as above. The two sashes done, start to paint the right-hand side of the window frame. Start at the bottom, inside part, also the outer framework, and proceed up to top, across top, and down the left-hand side. Do also as you go along the edges of the frame, next the wall, and finish up by doing the window sill and part under the sill, which will be the last of this job to do.

If there is a mantle to do, proceed as directed for doors, right-hand side first, then up to top and

around, down to the floor on the opposite side. But mantles vary in form. Some will have heavy and ornate top, in which case do the top first and the rest afterward.

The washboard or surbase is started at the right, working to the left; at least right-handed people will do it that way. It may be necessary to have a shield to keep paint from getting on the floor or wall. Apply the paint first to the board next the floor, then do the upper part, then the whole of it; after which do the molding on top.

In all kinds of plain painting endeavor to impose a good body of paint without its being too thick; rub it out evenly and smooth. For instance, taking a panel, or any surface, rub the paint on every way at first, in order to cover the surface, then rub it evenly across the part, then the opposite way, finishing always with the grain of the wood. Draw your brush straight, not in irregular lines.

PLAIN EXTERIOR PAINTING

EXTERIOR painting differs from interior work by not requiring the use of turpentine, though some painters use a little of that liquid, saying it makes a better coating than oil alone. The several coats required on new work are about the same in consistence as those used inside. They must not be too heavy nor too thin, in the one case being liable to peel or crack, while in the other case it will not wear well. If there is a secret of good painting it lies in the practice of the use of much oil in the paint, for it is an old maxim in the paint shop that oil is the life of paint. It is certain that a thin oil paint will do better than a heavy paint in which less oil is used. Nor does zinc white paint do well as compared with white lead paint. However, the use of one-third zinc white to two-thirds of white lead does very well, and makes a harder surface than does white lead alone. Zinc as a metal is brittle, and it carries this feature with it when made up into a paint. Unless tempered with white lead zinc white paint cracks and scales under the action of sun and weather. On the other hand, white lead paint is inclined to flour off like lime. This is why the two do better united; the one rectifies the fault of the other. They unite to make a better paint.

To repaint old work, such as a frame house, it

may be necessary to remove more or less of the old paint. The paint may be scaling or badly cracked, or it may have been a cheap dope paint. In such cases the scraper or burner may be used. The burner or gasoline torch is a dangerous method, as the flame may catch some loose, combustible substance about the loose boards or in the eaves and set fire to the house. Scraping is safer, though more tedious. Sticky paint may be coated over with some strong lye-water, which will soften the old paint, and the worst of it, or the surface at least, may be removed by scraping. But if the paint is in good condition except for color, then paint may be applied at once, and one coat may be enough. Get the new coat as near the color of the original coat as possible. In some cases it will be enough to apply a coating of clear linseed oil, which will fill the dry paint and give the finish all the effect of new paint. This is not often done, but it would save many dollars over applying new paint.

When the work is ready for the paint apply a first coat that has plenty of oil, though not as thin a coat as priming for new work. The second and third, if used, may be of medium heaviness, and well rubbed out, to give a smooth, even surface.

If the window sash need some puttying, first apply a coat of paint to woodwork and old putty, after having removed all loose old putty, and when the paint is dry, say next day, take common store putty and reglaze all places where the putty is missing.

Putty will not stick on bare or old unpainted wood. Use the best oil-and-whiting putty. Cheap putty will crumble and fall out in time. Pure putty will grow harder and not fall out providing the sash is kept painted.

To paint the outside of a house, begin on the cornice; finish that; then do the siding or weatherboarding from the top down. If there are corner strips to do paint them after finishing the weatherboards. Then do the windows, first taking down shutters and blinds, if any, and placing them under cover, where they may be done last. The second story shutters or blinds are done on the ground, and when dry are hung. But the first story shutters are usually done after finishing the window, so that they may be hung out of the way. The shutters are done the same as directed for a door, but instead of finishing at once about a foot or so of the bottom is left unpainted, so that the shutter can be taken hold of there and lifted on to the hinges, after which the lower part can be finished.

Blinds are done by laying down on two barrels, heads up, or on trestles of a barrel's height. Just enough of the ends of the blinds rest on the support to keep them from slipping. Begin with the inside of the blind, where the stick is that raises and lowers the slats. Do the slats first, shutting the slats flat, doing them, and then turning the slats up and doing what can be got at from there. After doing both panels this way do the framework and edges, but

leave enough of the same for a hand-hold to turn the blind over by, and also to carry it when done, setting it up under cover. There the unpainted side-holds may be done, and so the blind is finished.

In painting a building the rule is to begin at the top and at the right-hand side unless you are left-handed. Have your ladder at the proper angle or slant, and not too low at top, nor too high. Hang the paint-pot by an S hook, made by bending a piece of heavy wire into the form of an S. Sometimes the pot will set handy on top of the ladder on a rung. This is convenient when doing the cornice or top weather-boards.

A tin roof may be painted at any time, either before or after doing the body of the house. Scrape loose paint and sweep clean before beginning to paint. The best paint is made from iron oxide, also called iron or metallic paint. The pigment may be either dry powder or ground in oil. Mix it with linseed oil, making it quite thin. Add japan for drying it. Stir it well, and keep stirred while using. Brush it out well and do not miss any places. Avoid runs of the paint, for these and thick paint, or too much paint in places, will crack and so expose the tin. Brush the paint smooth.

Tin is sheet-iron which has been dipped in molten tin and lead combined; the poorer the grade, the more lead and less tin, so that it does not keep well from rusting. Pure tin will never rust, and sheet-iron well coated with pure tin will last well for a long time with-

out paint. Galvanized iron roofing is sheet-iron that has been coated with zinc. Never apply paint to it when new, but allow about one year to elapse before painting it. Excepting for appearance new galvanized iron, or that which has not been exposed to the weather for more than a year or so, looks well enough without paint. Shingle roofing is better when the shingles have been dipped before laying. However, the shingles may be coated with a stain after laying, or with thin paint, though paint is not advised if stain can be used.

Stables that have to be painted offer a problem in regard to the stability of the colors employed. There is a great deal of free ammonia there that affects certain pigments, and especially white. Zinc white is best to use, also any of the earth or mineral colors.

To paint a picket fence use ordinary oil paint. Begin on the side the pickets are nailed to, first do the edges of say about a dozen, so that you can reach them handily and not have to move your paint pot until the section before you is done. After the edges do the faces, then between the pickets, top and bottom, and so on until you have finished the outside of the fence. Then go inside and first do the faces of the pickets, then the rails. You will find it expedites the work by doing all the edges on one side for the length of the stretch before you, then turning your body and doing the edges on the other side. This is better than doing both edges of a picket at once and so finishing up.

PAINTING WITH FLAT OR WASHABLE PAINT

THERE is a washable paint that is not made in the old way with white lead and oil. It may be bought at the hardware or paint store, and there are many brands or makes of different manufacturers. Not all are good brands, and the householder has no means for determining what is good or what poor. But here is a good rule: The goods put out by a first-class house are to be depended upon, while those coming from less reputable or little known houses are not quite so reliable. By this I do not mean that some of the latter or smaller manufacturers do not make good goods, for quality does not depend upon extent of manufacture or resources. Some of the worst dope may come from a large concern, and some of the best from a small. Then, most manufacturers make more than one grade of paint, some as many as three, and these are priced according to quality. Some people want cheap paint, and there is no reason why they should not be furnished therewith. More sensible people will prefer the best and are willing to pay a fair price for it. The writer would urge the economy always of buying the best of anything that your purse will allow. This is particularly applicable to paint, etc.

Flat wall paint, so-called, does not do well in con-

nection with lead, that is, in intimate contact with free lead, but it does well over an old lead-painted surface. It is composed of a mineral pigment called lithopone, of which 80 per cent. is used in connection with 10 per cent. of zinc oxide. The remainder of the mixture is composed of coloring-matter and filling pigment matter. That is the dry material. It is thinned out to paint consistency with certain liquids, like turpentine, etc. Now, when you get a can of this paint open it and stir it with a paddle until a perfect mixture is obtained. If the paint is good it will not have settled in the can. It will easily mix when you stir it with a paddle. It will be a smooth paint of uniform texture and will brush out readily. It will dry inside of eighteen hours, with a hard, flat finish. It will not show laps or streaks, and any one handy at all should be able to apply it and get a nice looking surface. It is especially good for walls and ceiling. Its merit is, aside from its nice appearance, that you can wash it with soap and water without affecting its appearance. It should weigh $14\frac{1}{2}$ pounds to the gallon. Such, briefly, is this excellent paint. Wherever paint can be used on walls this is one of the most desirable. I will also add, good walls ought never to be covered with paper. Paper does well on rough or uneven walls, as it makes such a surface seem more smooth than it is, and more than paint can effect.

Usually when a wall is to be painted, and when it is in its original condition, never having been painted,

it is glue-sized, but when flat wall paint is used it will not do to use glue under it, for the nature of the paint tends to cause the glue to come from the wall, or water coming through the paint, where often made clean with water, affects the paint and causes trouble. No, better use varnish for the size, mixing it with some flat wall paint, say 1 quart of the paint to 1 gallon of varnish.

When painting a ceiling with flat wall paint use a step-ladder, and begin at the right-hand and work to the left, as usual in painting. Start in a corner and do a stretch about 3 feet wide, and carry this across the room. Then go back to the starting-point and do another stretch, and so on until you have coated the entire ceiling. Then do the side walls in like manner, beginning at the top of the wall, and at the right-hand side, doing a width of convenient size, down to the surbase. And so on around the room.

A flat bristle brush about 4 inches wide is best for this work. It is called a wall brush. Lay the paint on freely with a full brush, and lay it off even and smooth. Either white or tinted wall paints may be used, and with good effect. Do not try to color it, but get it the color you wish when you buy it, for there are some pigments that will not do, as, for instance, chrome yellow or chrome green, both of which contain some lead, which will not agree with lithopone. The manufacturer uses a chromium oxide or mixture of zinc yellow and cobalt blue. These

colors are also lime-proof, hence the plaster of the wall will not affect them. Finally, this form of paint, so useful and satisfactory when used inside, will not do well on the outside, and must not be so used. Exposed to the weather it will chalk and go to pieces very soon.

Most painters apply this paint like calcimine, which is not laid off like oil or turpentine paint, in even straight strokes of the brush, but criss-cross, which gives the effect of greater evenness and solidity. The flat wall brush enables you to get over the surface faster than a round brush. As the paint should not set quickly, you have time to do a job not showing laps, where two edges come together. Or should it dry too fast, simply add a tablespoonful of raw linseed oil to the gallon of paint. This will prevent possible laps and cause the paint to work easier under the brush. If you have had to repair cracks in the wall with some plaster of Paris, first coat the same with thin white shellac varnish and let this dry before applying the paint. See that the wall is dry before you paint it. If you have to use putty to fill some small cracks do not use common putty, which will show through the paint; use instead a putty made with dry white lead, best whiting, and mix with gold size to form the putty.

It should be observed here that this paint is not to be brushed out like white lead paint, but must be flowed on, full and freely, and work it as little with the brush as possible.

PAINTING AND VARNISHING FLOORS

A GOOD, hard, oil paint is usually best suited to the kitchen and porch floor, though where hardwood has been used on the former floor it may best be varnished. But paint is best for the porch floor. Paint withstands water better than varnish. Such floors as these have hard wear, and the paint used must be such that it will not be easily abraded by use. When laying a new porch floor the edges of the boards should be coated with white lead when the boards are being laid. This will ensure the cracks from being water conveyers to the detriment of the wood. After laying, the floor should be cleaned and any rough places be made smooth with sandpaper. Then apply a medium coat of lead and oil paint, with a little japan drier in it. But the succeeding coats, two more usually, should be applied. After the first coat has become dry all open places, such as cracks, nail-holes, etc., should be filled with common putty. I ought to have said before this that the floor should not be first coated until the wood has had ample time for drying. Damp wood should never be painted. Even damp painted work should not be coated with paint until it has dried off. New wood will have time to develop possible faults, cracks,

etc., if left to the weather for some time before painting.

A porch floor of hard pine is more difficult to do successfully than one of a softer wood. The paint is not so well inclined to adhere to it. In such case the proper thing to do is to apply a coating of benzol before applying the first coat of paint. Benzol will soften up the rosin in the wood, and the wood will then take and hold the paint better. And a little benzol in the first coat of paint will be well; indeed, as much as one-half of the amount of oil used. The paint must be elastic, yet hard drying. As very good floor paint may be had at the paint store it will be unnecessary to give here a formula for mixing it; it would not pay to mix your own.

Applying the first coat, rub the paint well into the wood, especially if it is hard pine, and leave little paint on the surface.

Where the porch floor has had some years of use and requires repainting, first touch up all worn parts with the paint, which allow to dry hard, then smooth with sandpaper, after which the entire floor may be coated. Two coats may be needed. If the porch is well worn pretty much all over, then do not touch up the most worn parts, but give the entire surface a coat.

The kitchen floor is usually hard pine, though the old-time floors are not. The paint and painting is the same as given for the porch floor, and if done the last thing in the evening it will be hard enough to

walk on in the morning. For an extra quick job, where the floor is in steady use, as in hotels, for instance, the finish may be done with shellac varnish colored with any desired color, this drying hard enough to use after a few hours. If the floor is hard wood and has not been painted, but finished in varnish, it may show some dark and worn places that will have to be attended to before applying the finish. Scrape away dirty parts, or remove by washing, and after all has been done and is dry, apply the varnish. A new floor of light wood should not be oiled, as oil discolors the wood; better give it a coat of shellac, and finish with hard floor varnish, or with shellac and with a wax finish on that. Or two coats of wax on the bare wood may do.

To apply varnish to a floor use a good-sized varnish brush, and fill the brush full and flow the varnish on freely, rubbing it out evenly. Do a few boards at a time, thus avoiding possibility of laps. Rub the varnish well into any cracks or uneven places. Varnish works best where there is no draft, and a warm temperature also is best. After the job is done the room should have all the air possible, which will carry off the fumes of the varnish and assist in the drying.

SELECTING COLORS FOR THE HOUSE

NEXT in importance to applying the paint is the selection of the colors. Most householders have little experience in this matter, and others have little or no good taste. For the latter, one good plan is to see as many similar houses as possible and to choose from one of them the coloring that seems to meet their desires. Today little color is used, white having the call. People as a whole have tired of the gaudy and meaningless assortment of hues, shades, and colors that have been in vogue since the time of the Centennial Exposition in Philadelphia, at which period there was in our own country a revival of the old Queen Anne styles of architecture and coloring. White seems to set well on any kind of architecture. While especially adapted to the Colonial style, it does very well on any plain box-type building. And the white vogue is taken to its limit, for not only the cornice and sides of the house are done in white, but every part of the structure, so that those favoring white could scarcely ask for anything more. But a bit of pure black is sometimes added as on the ends of rafters, etc., and the putty on the window sash.

Now there is this to be said in favor of the pure white color scheme, it removes the difficulty of choosing colors. But it is important to secure a pure white

paint. Some brands of white lead are rather off color, or not white. Certain other brands are very white. But if about one-third zinc white is added to a white lead the paint is not only made the better for it as to wearing, but it is a very pleasing white. When white lead and oil paint is first mixed and applied it looks rather of a yellow cast, due to the linseed oil, but the weather will bleach the oil in time and give a pure white. However, as white lead is darkened by gas that is always present where coal is largely used, especially soft coal, the white paint is likely to become rather gray, and sometimes even quite dark. In such a case a color is to be preferred to white. It is one of the weak points in white lead that it is easily darkened in the presence of gas or sulphur, the sulphur uniting with the lead to form black sulphide of lead. For this reason some prefer zinc oxide paint, which is neutral in the presence of gas or sulphur. More will be said upon this head further on. It is mentioned here on account of the bearing it has on colors.

All colors are derived from the three primary colors—red, blue, and yellow. Another classification calls for several more colors, but they are simply gradations of these three primaries, and need not be described here. From these three basic colors the painter obtains all the colors he employs except black and white, and these are used for either making lighter or darker, as the case may be, any of the primaries or any mixtures of them. White stands

for the union of the three primaries, while black represents the absence of all color. There is no such thing in nature as absolute black, as any black you may see contains some light, or white, which grays the black more or less. It is useful to know these simple natural color conditions in order to understand the relations sustained by colors one to another, so that good harmonies may be obtained when selecting a color scheme for painting a house or other structure.

The person who selects a color scheme from his color preference alone, or simply according to what he conceives to be "good taste," may make a mistake, as a building demands color treatment as an individual object. What may appear well on one style of house may look entirely wrong on another type. Then its location and surroundings must be considered too. There are some certain colors that will do pretty well in almost any case, and they are known as "safe" colors on that account; the inexperienced is less liable to go wrong on them. These colors are mainly the reds, grays, yellow, brown, and white. If the structure is without fine architectural lines, ugly in fact, then the grays and the browns do well, but the gray should be made rather on the yellow cast, not on the black, which makes a cold shade. White, as previously stated, will do on almost any type of house, but is especially well on Colonial and most country houses. The white house in the country looks well in the distance, whether surrounded

with trees and shrubbery, as in summer, or amid bare trees and leafless shrubbery, as in winter. The low, squat house does best when dressed in light and cheerful colors, which serve to increase the apparent height of the building. Dark colors would tend to the opposite direction.

For the true Colonial style of house white does the best, and at any rate, if colors are to be used, then avoid dark or pronounced ones. If white be chosen, some dark color is admissible, as bottle or other dark green for shutters and blinds. For an old stone farm-house whose walls are white a lighter shade of green may be chosen, say dark or medium chrome green. But if the walls are yellow, then some shade of stone color would perhaps look best, a dark shade, on the gray. The wood work should be pure white. The doors may be white or be grained to imitate oak, either light, medium, or dark, all looking fine when well done and varnished. A sort of brownish-gray for the walls is another color that looks well on the stone walls, with white trim and dark green blinds.

Almost any color seems to answer on the trim of a white-bodied house, such as a tint of green, gray, pale yellow, or a very light shade of brown. The white house trimmed with such colors will present a neat and attractive perspective and have its architectural features brought out and enhanced in value.

Then in case the body color becomes tiresome and a change is desired, it may readily be accomplished

by painting the house a warm drab, or a medium shade of that color, or a gray stone; ivory white with pure white trim is nice or with a colored trim. In fact, the varieties of changes possible are very great, and where color fads are in vogue, as we have seen during the past years, though not to any great extent of quite recent years, it is well that we can change color to suit either the individual taste or preference, or to keep up to the vogue prevailing. And it should be remarked here that fads are seldom worthy of a following; simplicity and good taste, based on the laws of color harmony, is a safer guide.

A color scheme should be simple and fit the style of architecture, as also the natural and artificial surroundings. A painted house should appear as a part of the landscape. We should consider the fact of the presence or absence of trees, etc., distance from nearby houses, with their color schemes, etc. Some houses must be painted white, both trim and body, though this case is exceptional; in general, the house done entirely in white does not show up well. As a rule, the white house does better with some color to the trim, and bottle green, light slate, medium drab, produced with yellow ochre and black, and a fine gray all answer the purpose and have been largely used in the past, though just now, as previously stated, the pure untrimmed white has the call. Of course, in due time this will be changed. Fashions change in house painting, as in any other line. One advantage, though it is not of course its only one, is that

a colored trim shows up the white to better advantage, making it look even whiter. The following table shows some of the color schemes that have had a vogue in past days.

The colors given are arranged in the order of body, trim, and sash:

Pearl gray, pure white, maroon.

Cream, light brown, dark bottle green.

Ivory white, pure white, maroon.

Pure white, dark bottle green, black.

Medium drab, ivory white, maroon.

Chocolate brown, pure white, white.

French gray, pure white, maroon.

Colonial yellow, pure white, white.

Bronze gray, pure white, maroon.

Fawn, pure white, maroon.

Bedford stone, ivory white, chocolate brown.

Slate, pure white, maroon.

The following table of color schemes will prove interesting and useful in the selection of harmonizing colors for the house:

Colonial or Formal: Body white, yellow, or gray; trim white; roof natural wood shingles or slate; blinds moss green, bronze green, or green.

Picturesque or Irregular: Body red; trim red with white sash; roof natural wood shingles; blinds very dark green. Or, body brown; trim creamy white; roof moss green; blinds medium green.

Mansard Roof: Body yellowish gray; trim the same; roof usually slate; blinds green.

Small Cottages: Body red; trim, if not much of it, white. Shingles, wood, natural; never use red if slate roofing is blue. Blinds dark green.

Upper and Lower Story is Different: Body red below, gray above; trim in either case to be self-colored and sash white; roof natural wood shingles; blinds dark green.

Cement and Stucco: Body white, yellow, or gray; trim brown stain for white and yellow, and white for gray; roof in all three cases red; blinds, for first two cases, dark or bronze green; for the gray body use a pale blue green.

In suburban places it is well to select colors that will not duplicate others nearby, no matter how attractive they may be; select colors that will harmonize with neighboring color schemes rather than outdo them with other and higher colors. Co-operate rather than compete.

The summer cottage is a temporary structure built for passing pleasure rather than for residence in a more substantial way. Cottages do best with light or with bright coloring, seeing that such treatment will accord with their purpose.

When more than one color is to be used on the side of the house the lighter color should always be placed above the darker or heavier color, for this accords with nature and also with architecture, dark coloring standing for solidity and strength, while light coloring conveys the idea of lightness and rela-

tive weakness. This rule is also to be observed when doing the interior.

The window frames of brick and stone buildings should be painted the color of the cap-stones and window-sills. For example, a brick house ornamented with limestone copings should have the window and also of course the door frames painted a light gray stone color; the window sash may be done either black or dark green.

A city house on a small lot, near the street, should be painted a quiet color, with dark trim.

Quiet colors, pure white in particular, grow more and more in public esteem.

In painting business houses or factory buildings, where there are heavy members carrying heavy loads, these features should be painted in the darkest colors used in the color scheme employed; those with the lightest loads to carry should be done in the lightest colors used in order to appear more slender.

A light, airy structure will look stronger if a dark color is used unless the background is dark, when a light colored paint affords relief. With a small structure, in a large or deep landscape, more attention should be paid to the matter of contrast.

The following are practical color schemes given by an architect:

A good combination shows a rich olive body with white trim; roof, moss green; side gable, deep buff; sash, greenish black; door, deep green; porch floor, a

green between the door and body color; the foundation a sandstone tint, with chimneys a cream.

A low-posted cottage will appear very attractive with body and trim white; roof stained olive green; chimneys and foundation red; porch floor mossy green or burnt sienna. A good alternative scheme would be a copper-red roof and white body. This gives a crisp and attractive effect.

A small house may be made to appear very attractive by doing the first story in chocolate color, and the upper story in a lighter chocolate, with white trim, sash deep maroon, and porch floor and steps a deep, dull yellow. Stain the roof brown, and the effect will be very satisfactory.

It is hardly the time to talk about such schemes as deep lemon yellow for the body of the house, but not so long since it was much in evidence, and, even now, in some cases would do very nicely. The trim is white, with a soft, harmonizing green for the gables, sash in black, roof moss green, with brick foundations and chimneys red. This coloring looks well when seen in the midst of green shrubbery and shade trees, but in winter the colors are rather obtrusive and insistent.

A double house on a small lot requires a coloring that will cause the structure to recede rather than stand out. A square form would suggest a modest color effect. A deep seal brown throughout, black sash, warm green roof, and red chimneys, porch floors

and steps a very dull buff, ceiling of porch cream; such will give a very satisfying coloring.

An attractive coloring shows a green-shingled effect with white trim throughout; but in case siding must be used, lay the chimneys in cream brick. Stain roof golden brown, paint gables and body tan, bordering on chocolate, make the sash a deep brown, trim with white, paint the porch floors with Vandyke brown, medium shade, while brick foundations may be painted to match the body color.

The location of a square house should, almost of necessity, be known in order to properly plan its coloring, for its form is so easily accentuated to the detriment of the design, whereas, it might be as easily, with a little thought, subdued and improved upon. Assuming that the house occupies an ordinary level city lot, the lower story and trim a very deep, dark green; the upper story a deep, dull pumpkin shade, and the roof a moss green. The chimneys and all brick work should be red, and the sash painted greenish black, while the porch floor should be olive green, with the ceiling a cream.

A good color scheme for a small building, stable, or certain forms of a garage, is to have the body a dark drab, rain conductors dark green, doors green with drab panels, and sash either Indian or Tuscan red. If there are shingles on the sides they may be oiled, and the same if the sides are of brick. Roof shingles should be dipped in stain and be brush coated in red. Interior woodwork natural.

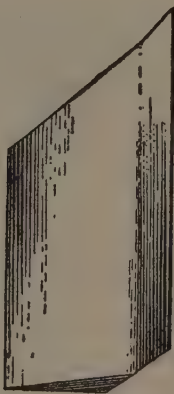
PAINT BRUSHES AND HANDY TOOLS

THERE are here illustrated some of the principal paint brushes used by painters. Some prefer the wide flat brush, while others choose the round or oval brush. But it is more than mere choice, for the round is best for certain kinds of work, while the flat does best on certain other work. For instance, if you are to paint the sides of a house the wide



flat brush would enable you to get over the ground faster. But when you come to doing doors, frames, shutters, and trim the round brush will be found

much handier, though in parts of the country, particularly in the West, the flat brush will be used for all sorts of surfaces, large and small. The brush shown here is a chiselled sash tool, used for small places, such as window sashes, from whence it derives its name. The chiselled tool is to be chosen when

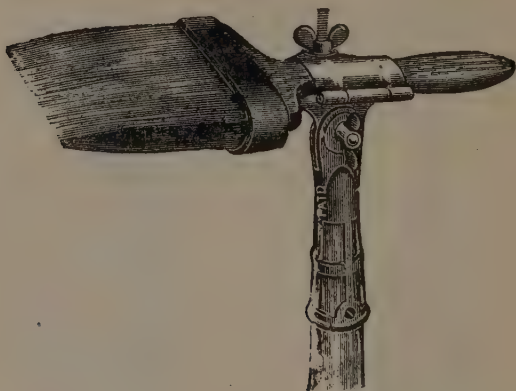


The Paint Shield.

mainly sashes are to be done, but when the round or unchiselled brush is used for some time it becomes chiselled too, and is then in its best condition for "cutting in" window sash.

The three illustrations shown next are, first, a handy little device to keep paint from getting on

other parts where not desired, as when doing window sash, etc. The next (page 40) shows a "man help," as painters used to call it, when they tied a paint brush to a light pole and reached places difficult to reach otherwise with paint, etc. This tool is adjustable to any degree of inclination desired. It is one of the most useful of tools to those painting houses, etc. It does equally well for whitewashing also.



On page 41 we find a gasoline torch for burning off paint, etc., another very helpful little tool. We used to remove paint with a charcoal furnace, a very troublesome way, and not without its element of danger to the user.

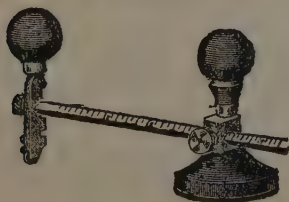
One of the most indispensable tools you will find to be the glass cutter. The best for general use is the magazine kind, which contains six cutting wheels in

a turret head. When one of the little case-hardened wheels will no longer cut, another may be used by



Gasoline Torch No. XX.

unscrewing the turret head and carefully placing the new wheel and securing it with the screw. Each wheel



is supposed to cut about 500 feet of glass, that is, a line cut that length, or, most likely, not so much, for

it depends on the character of the glass, some being much harder than others. Old glass is always extremely hard and difficult to cut with the steel wheel at least, and then only when the wheel is quite new. A little turpentine on the wheel helps it when the cutting is hard or the wheel nearly worn out. These little tools cost about 25 cents. There is a circular glass cutter, handy when you have to cut glass into a disk or circular. The little 40-cent cutter will cut circles from 2 to $22\frac{1}{2}$ inches. Then the cutter may be removed and used for straight line cutting, though this is not advised, as you will have a magazine cutter. The circular cutter has a felt base to prevent slipping on the glass. Extra steel wheels for this tool cost about 3 cents each.

Mention has not been made of the painter's duster, round or flat, yet this is a tool that will find uses not only in painting, for removing dust, etc., from the work, but will prove the best sort of brush for dusting down the stairs, or for getting into similar places in house-cleaning time; it is handier than the usual dust brush.

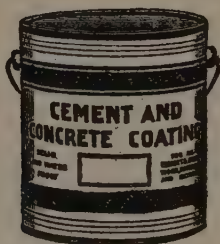
When pot hooks are required for painting outside of house they may be bought for a few cents, or be made from telegraph wire, bent into the form of an S, with one part bent small, to receive the pot bail, while the other end may be made large enough to catch on to the ladder round. The wire can be filed part way through, then be broken off, or a hit with a hatchet will do. File the cut ends of the wire to smooth them.

How to Measure House for Paint.—Measure length, width, and height of the house. Add together the total amount of the two sides and two ends. This will give you the total number of square feet to be painted. Divide these figures by 250, which will give the approximate number of square feet that 1 gallon of paint will ordinarily cover with two coats. If the building is new, or old and in bad need of paint, it will need three coats, in which case divide by 165 instead of 250.

In estimating the gables, measure at the middle vertical line, and divide by 2; thus, say it is 10 feet from the square of the building to the peak, call it 5 feet, and multiply accordingly, or include that area with the ends when measuring. Such measurements as those given here are near enough for practical purposes, and will enable you to order properly; if there is not enough paint, more can be had of the same color and quality if you use ready mixed paint, which you are advised to do, getting the best grade, for there are several qualities, and the inferior are not to be accepted as a gift, for they will cause you trouble and expense, besides not giving you a good-looking job. Do not try to see how much you can save by buying cheap paint, but see rather how wise you can be by getting only the best.

When estimating for paint by measuring the house make no deductions for openings such as doors and windows, for the frames and sash will take as much as plain surface of equal dimensions would require.

Paint for Concrete.—Concrete, cement, stucco, and brick should be coated with something to protect the surface and add to its appearance. There is a commercial article for the purpose, and it is said to be rainproof, as it seals the pores of these substances,



and it prevents dampness from causing peeling off. It may be used on floors, walls, etc., and covers about 100 square yards to the gallon, two coats. If too thick it may be reduced with a liquid that may be had when buying the coating itself. It costs about \$2.50 per gallon can.

HOW TO FINISH WOODS

PERHAPS the most of the wood finishing done by the householder concerns floors, and refinishing is perhaps more often done than finishing new work. At any rate, there is a demand for information from home owners covering this question, and I shall try to meet their requirements.

Now, this work must be done right, and in the same manner that an expert would do it, or it will fail to please. Fortunately, the methods are not difficult, and by following directions a perfectly satisfactory job should result. First of all, the wood must be clean and bright if its natural beauty of form and color are to be preserved and brought out even with more beauty than in the unfinished original. It must also be smooth, all imperfections removed or covered up.

There are two forms of wood, hard and soft, or close and open grained. It is important to know which is which when about to finish a wood. There is a useful table on page 46, showing the woods classified according to their structures.

The lists given do not comprise all the various woods that are employed in cabinet work, furniture, and house trim, etc., but do give about all the woods that the householder is likely to have to do with.

Close Grained

Birch,
Cypress,
Gum,
Maple,
Poplar,
Spruce,
White Pine,
Yellow Pine,
Redwood.

Open Grained

Ash,
Rosewood,
Butternut,
Chestnut,
Elm,
Mahogany,
Oak,
Pitch Pine,
Walnut.

An open-grained wood requires filling with paste filler that the open places in it may be filled level with the surrounding surface, and to prevent the absorption of the varnish when it is applied. It makes a firm foundation for the finish.

Though classed together, a group of woods will be found to differ considerably regarding their structure, as oak, for instance, compared with walnut. Oak, ash, and chestnut are particularly open of grain. The rest of the list are not so open, and in some cases—pitch pine, for instance—are both close and open grain on the one piece of wood. In the former woods—oak, ash, and chestnut—the solids fill the pores and open streaks full, while the liquid part of the filler will saturate and fill the cellular structure, so that it will be incapable of taking up any oil or varnish. With the other woods of this class—pitch pine, for instance—the pigment part of the filler will fill the open parts of the wood and simply lie on top

of the hard parts, afterward being removed by rubbing.

The close-grained woods are filled with a liquid filler, such as shellac, genuine or imitation, or a special liquid filler, a varnish containing the same pigment material as that in paste filler, but thinned down more with varnish. After paste filler has been applied it is left to stand about fifteen minutes, when it is rubbed with coarse material to rub in the pigment and remove the surplus from the surface. Liquid filler is never rubbed off after its application, but forms the filler and first coat of varnish.

In the case of very coarse-grained woods—the oaks, chestnut, and ash—it is sometimes advisable to first apply a coat of raw linseed oil, which satisfies the wood so that it will not greatly draw on the varnish when it is applied. But there are some woods where this will not be so useful, inasmuch as it would injure the natural light color of the wood. Maple is an example of this. Oil must *never* touch this wood. It is to be first coated with white shellac varnish. However, first coating with oil is very seldom done by experts, mostly on account of the extra work and time involved, which means extra expense.

Paste filler can be bought at the paint store, but will need thinning before using. The filler should be about the consistency of stout paint when applied. The filler as it comes in the can should be thinned with turpentine. Apply it liberally with a rather short and stiff haired bristle brush—a half-worn

paint brush is good. Brush it crosswise and rub it in well, and after doing this let the job stand about fifteen minutes, then rub the surplus off with some substance of a coarse nature, such as excelsior, or coarse jute cloth, rubbing across the grain of the wood only. This done, let the job stand for twenty-four hours, then sandpaper smooth, using No. 0 or 00 sandpaper. Dust off and you are ready for a coat of varnish or shellac, as the case may be, and which will be explained further on. Two coats of varnish should give a good job. The floor will require a good floor varnish, which dries hard enough to walk on in twenty-four hours.

If you wish to change the color of your paste filler to suit another wood than plain natural, here is a color table to use:

Light Oak: Add some raw sienna or yellow ochre.

Dark Oak: Add burnt umber or drop black, or both.

Golden Oak: Add asphaltum or burnt umber.

Walnut: Burnt umber, with a little Venetian red or rose pink.

Black Walnut: Add some Vandyke brown.

Mahogany: Burnt Italian sienna, rose pink, and a little drop black.

Redwood: Burnt sienna and a little rose pink.

Cherry: Either burnt sienna or Venetian red.

FILLING THE VARIOUS WOODS

Ash: This is to be filled with stiff paste filler, the same as oaks. The filler must not be colored.

Butternut: This wood is also known under the name of white walnut. It is filled and finished the same as ash and oak.

Beech: To be filled with liquid filler. May be finished natural or be stained any desired color, walnut, cherry, or mahogany. Use water stain and finish with a gloss.

Birch: Liquid filler or shellac varnish. It may be finished light or dark, and the filler should be in accordance, light or dark; if shellac is used it should be orange or white shellac. Birch looks well stained mahogany color.

Cherry: Usually stained with burnt sienna in oil. The natural finish also looks fine. But mahogany stain is best, for there are light and darker parts in this wood, and the stain makes all one color.

Cypress: Finish about the same as birch and cherry. First coat with shellac, when dry sandpaper it, then apply two or even three more coats of shellac, sandpapering each coat.

Chestnut: This wood is very open grained, and will need a stiff paste filler. The wood may be stained oak color or be finished natural, as it usually is.

Elm: Has a large pore, but not as deep as that of ash and oak. It also has sappy places that are lighter in color than the rest of the wood, and these

places must be stained to match the rest. Do this after the wood has been filled and sandpapered; have a cup of water stain and touch up the sappy parts with a small brush or a soft rag. The stain may be made from either burnt umber or Vandyke brown.

Maple: First coat with white shellac. One coat may do, but in some instances as many as four are applied. Finish with a pale copal varnish. A floor will need more varnish coats than furniture.

Mahogany: This wood requires a paste filler, and after this a coat of shellac, or two coats; rub smooth each coat with fine sandpaper, after which apply two or three coats of varnish. Mahogany is usually stained, but the stain should not be too dark.

Oak: To be filled with paste filler. Oak is done in more different kinds of finish than any other wood. The principal finishes are Natural, Light Antique, Dark Antique, Golden in various shades, Fumed, Flemish, Weathered (in seventeen different ways), Antwerp, Cathedral Brown, and Mission. But with all these (and this is not a complete list) oak is never quite hidden or disguised, but always stands forth as oak. This cannot be said of any other wood used in finishing.

To make a golden oak the stain should be applied first, before the filler. Use a thin stain and do not wipe it off. Then apply the filler.

Redwood: This wood requires a paste filler, which is to be rubbed into the grain and pores of the wood, and after standing a little while is rubbed off, as has

been described elsewhere in this work. After this and the sandpapering a thin coat of shellac is applied; this, in its turn, is sandpapered and another coat of shellac is given. Then it is ready for as many coats of varnish as may be desired, two to five coats. The finish is a rubbed effect. The last coat of varnish is carefully rubbed with flour pumicestone and water, with a piece of felt for a rubbing pad. This rubbing is not to be done at once, upon the drying of the varnish, but two or three days should elapse, in order that the varnish may have sufficient time to get hard. In twenty-four hours after this rubbing it may be rubbed with powdered rottenstone and water; wash off and wipe dry with a soft chamois. Then it may be rubbed with a little sweet oil on a rag, which will brighten it up; but rub off all excess of oil. This is a first-class job. A cheap job may be done by simply shellacking the wood and applying one or two coats of copal varnish, rubbing the last coat with moss or curled hair to remove the gloss.

Red Gum: This makes a very fine finish with mahogany stain; its figure is handsome. It may also be done without staining, its natural color, showing under the slight staining effects of the varnish, being attractive; but usually it is stained. It does not have to be filled, but it should be shellacked. Brown stain, also walnut, as well as mahogany stain, looks well on this wood. After the coat of shellac give it two coats of varnish. Filler injures the fine figure of this wood, and even experts, not knowing this, sometimes fill it.

Sycamore or Buttonwood: There is the plain sawed and the quartered wood, the former very nice, but not as handsome as the other. Finish this wood natural. Use a thin white shellac unless you stain the wood, in which case use the orange-colored shellac. The finish may be with varnish, rubbed dull or left in the gloss. Usually light colored woods, maple, for instance, appear to better advantage when done without a luster finish.

Walnut: Stain it first, then when dry give it a paste filler. If the wood shows light spots touch them up first with the stain, let it dry, then apply the stain all over the work. Use a water stain. The filler must be colored with Vandyke brown or burnt umber with some black in it. The finish is in varnish, either with or without luster.

Yellow or Hard Pine: This is often filled with liquid filler, but some samples of it contain soft places, so that a paste filler must then be used. This will fill the soft or open parts, and the rest may be rubbed off. See that the surface is perfectly clean and free of marks of all kinds, then sandpaper it smooth, dust off, and give it a coat of white shellac. Then fill all imperfections, nail holes, etc., with putty made from white lead and whiting, with a little ochre in it to make it more like the color of the wood. Sandpaper lightly and apply a coat of shellac. Finish with good pale finishing varnish, reduced a little with turpentine.

White pine and white wood and all similar light

colored woods should be finished so as to preserve the natural appearance, except when it is stained. Oil darkens it, hence shellac, the pale or white, must be used.

FINISHING HARDWOOD FLOORS

The floor-layer tells us that after a floor has been laid it should have several days to "work and set," say seven or eight days with a warm temperature. But in the meantime the floor should be protected from damage, as spots of tobacco, etc., with shoe-nail marks, etc., otherwise there will be much more work to do when it comes to finishing it.

The floor should be scraped or machined to get it even and smooth. The machine will use No. 1½ sandpaper for the first cutting, then with No. 00 paper, which will give the floor a sort of polish. First the machine runs across the grain, then with the grain of the wood. Machines now run close up to the baseboards, and this saves much time and labor by hand. Then the floor is swept up, the last sweeping being done with a broom having a flannel cloth tied over it; the cloth is slightly dampened with oil, which takes up the fine dust.

The best flooring of oak is known as clear grade, and this should be filled with either uncolored paste filler or with a little oak color added. The next two grades, select and sap, should have a light golden oak filler, and, after filling the wood, go over it with a little burnt umber stain to darken the light streaks. Thin the umber with turpentine. This will make

these two grades appear nearly as well as the clear grade, only that the touched-up places will show a little darker. Then there is a No. 1 common grade, which had better be filled with golden oak filler, darkening any light streaks, as previously advised. A good deal depends on how careful the floor-layer is when laying this latter grade as to whether the effect in the finish will be fine or otherwise.

The wood is filled and rubbed as has already been described, and then follows a surfacer, a thin coat of varnish. Sandpaper the varnish coat when dry and hard, then apply a coat of rubbing varnish, which when dry is rubbed to remove gloss, and a second coat of rubbing varnish is given, which, in turn, is rubbed with powdered pumicestone and water. Wipe up, and after the work is dry apply the finish, floor varnish or wax.

For wax finishing take cheese-cloth, double it, and make it into a bag; place powdered wax in it and go over the floor with it. The wax will work evenly through the meshes of the bag, and thus prevent waste and unevenness, or use the wax prepared with turpentine if you prefer it. A weighted brush is good for polishing. Run the weighted brush across the grain of the wood, then with it. After doing this, go over the floor again with the brush, but this time with a piece of felt or Brussels carpet under it. A second coat of wax may be applied after the first coat of (wet) wax polish has been given. Allow an hour between the two coats.

Wax gives a cheap and fine appearing finish, but it is not so durable as varnish. Two or three coats of varnish are to be preferred for hard service. For common work two coats of floor varnish are applied on the paste-filled wood.

Hard pine floors should be finished preferably with shellac; for copal varnish does not do so well on this wood. Some finishers say that neither of those liquids should be used, preferring a dark oil stain. This is wiped off before it dries, and when the work is dry apply a coat of equal parts of raw linseed oil and turpentine, with a little drying japan. This must be wiped off dry. First wipe across the grain of the wood, then with it. The idea is to get as much oil and stain into the wood as possible, as it has its soft places. This sort of finish has its advantages. It does not show scratches nor does it wear in spots. It is easily renewed and revived. The floor is not slippery. The color improves with age.

If it is to be finished natural first apply liquid filler of a pale color, or a coat of pale shellac, following with light varnish or with wax, as preferred. Or finish with two coats of wax if you wish.

Keep in mind the principle that the less material you have on the floor, the better it will wear.

Beeswax is quite soft, but there are harder waxes, and the commercial prepared waxes are usually made upon a formula that includes some hard wax. This gives a better polish, too, than pure beeswax. For instance, there are Carnauba wax and ceresin. Bees-

wax need not be used at all in floor wax. Equal parts of ceresin and Carnauba waxes, melted and thinned with turpentine, is a sample formula. When cold it is like stiff butter.

There are machines for polishing waxed floors. One looks something like a lawn mower, having a revolving brush in front to distribute the wax solution as it drips from a vessel above it. This is followed by a series of reciprocating brushes that do the polishing. Another arrangement consists of two hinged boards arranged in triangle form. This is worked over the floor by a long handle. Provision is made for fastening cloths over both boards, one for distributing purposes, the other for drying off and imparting a polish, but the weighted brush is most in common use, and even this need not be the store article, for a carpet-covered brick will do as well, or by screwing several scrub brushes to the bottom of a wooden box of proper size, weighting the box with bricks or other heavy articles.

To wax an old floor see that all cracks are filled and all holes stopped. Remove all stains. Scrub the floor clean and get it as bright as possible. When clean and dry give it a coat of raw linseed oil, or equal parts of oil and turpentine. The excess oil should then be removed either with cloths or by sprinkling sawdust over it, then sweeping this around the floor. Follow with a weighted brush, to smooth and polish the flooring. Then it may be waxed and polished in the usual manner.

A polished wax floor is rather slippery and dangerous for dancing on. The wax may be removed if desired before dancing, then be rewaxed afterward.

The addition of from 10 to 20 parts of rosin will make floor wax harder. Or add Carnauba or Japan wax, which are hard, but not brittle. Paraffin wax alone is too brittle, though it may be used with soft wax to harden it. It is short and crumbly.

If you wish to color the floor wax, annotta is very desirable.

In applying floor wax, use it thin and rub it well. Beeswax, in particular, should be used thin, for if too thick it shows shoe marks too plainly.

After applying wax allow it an hour at least before rubbing; this gives the turpentine time to evaporate.

Fresh made floor wax is best, though if kept well covered it will remain good a long time; by being uncovered for some time the turpentine leaves the wax alone.

A brush weighing about 14 pounds is about right for waxing a floor, though a lighter one will do very well too.

After polishing with the weighted brush let the work stand until next day, then go over it again, with carpet under the brush.

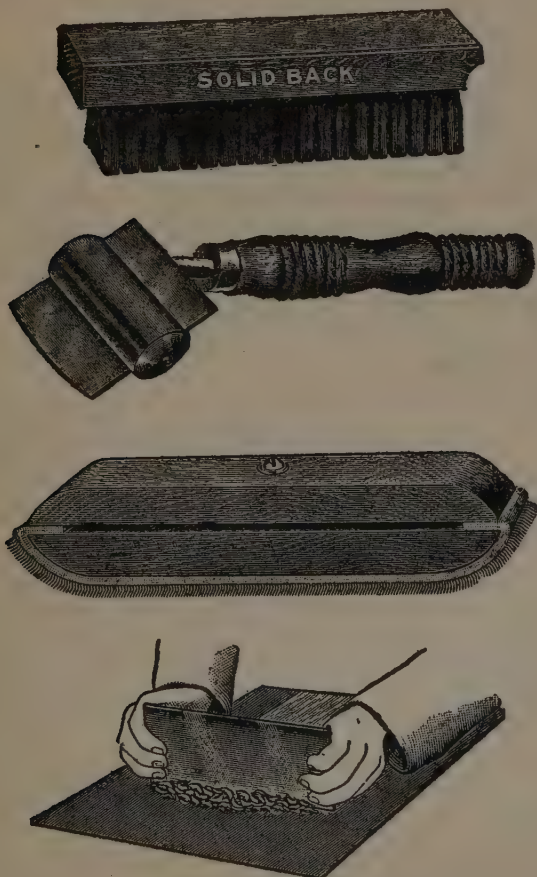
TOOLS USED IN WOOD FINISHING

If you have a solid but very rough or uneven floor it should be scraped or planed, and if the work is rather extensive, then it will pay to have it done with a machine, which will leave a fine surface and at much less cost than a new floor would require.

But for a small job, say where there are only some few places where the floor is bad, or where you wish to remove paint, varnish, or stain, a hand scraper will suffice. There is a small, inexpensive hand scraper, as shown in the annexed diagram, that may do, or a larger one, also shown in this connection, and not expensive; it can be furnished with extra blades as they are needed. The first scraper shown herewith is simply a sheet of steel, sharpened, but it is very efficient for scraping. The blades are easily sharpened when dull, and they are 5 inches wide by $3\frac{1}{2}$ inches high.

There is a wire brush woven upon a strip of heavy canvas, with the teeth set at an angle; the strip is secured by a screw between two wooden blocks, and can be replaced in a moment. The wire can be worn down to the face of the canvas, so there is no waste. It removes varnish or paint quickly and cleanly.

There are other wire brushes, one of which is here



illustrated, and they are useful also for removing old or hard paint and varnish.

For applying wood filler a half-worn paint brush, or one worn two-thirds down, is very good, though you can buy a special filler brush.

For varnishing there is a chiseled Chinese bristle brush that is very handy for large surfaces, such as floors, and it does equally well as a paint brush, though if used in varnish it should not be used in paint, and vice versa. Get brushes of such size as will be best adapted for the size of the work, and it is well to have a set of various sizes, keeping them when not in use in raw linseed oil.

POLISHING WOODS

WHAT is called French polishing is a very long and tedious process, and is little used nowadays on this account. It consisted in repeated coats of shellac being rubbed into the wood, and upon the wood, coat after coat, by means of a rubber made from strip woolen goods, rolled up like tape. The rubber is dipped into shellac, or rather a few drops of shellac are dropped on to it, and now and then a drop or two of raw linseed oil, to make the rubber work easier. The result of these rubbings, many coatings being given, is a fine, hard, polished surface, durable as well as beautiful.

A quicker and easier way to produce a French polish finish is done in the following manner: Fill and stain the wood, then apply a coat of shellac varnish, after which apply two coats of good rubbing varnish; sandpaper between each coat, and rub the last coat to a dull finish with powdered pumicestone and water. Now it is ready to polish. Mix together 1 ounce each of muriatic acid and turpentine and 1 pint of raw linseed oil. Take about 2 ounces of cotton waste and moisten it with the above polish; place around the wad of waste a piece of cheese-cloth that has been first dipped in water; place it about the waste to form a ball or rubbing pad. Sprinkle a

little fine rottenstone powder on it and rub the surface that is to be polished. The more it is rubbed, the better the polish. When the polishing is finished rub it off with a piece of cheese-cloth dampened with alcohol; be quick about this, as the alcohol might injure the polish. It is for the purpose of removing the oil from the polish, which would mar it if left on.

Oil polishing is good where the article or surface is subject to much wear or exposure to weather. It is the most ancient of all wood finishing processes. The idea is to saturate the wood with linseed oil until it will support oil on its surface.

The soft woods are not well adapted to oil polishing, being too open grained and absorbing too much oil. Any of the hard woods, such as beech, chestnut, mahogany, oak, etc., do best. Hard pine also does well. Oil polishing may be done on filled wood, but it makes a better finish on the bare natural or stained wood. Only linseed oil should be used for this form of finishing, and the boiled oil is preferable to the raw. It should be observed here that what often, if not generally, passes for boiled linseed oil is only raw oil fixed up to imitate the boiled article. Of course you can buy the raw oil and boil it on the stove, as you would not wish a great quantity. The old time painters used to boil the oil until hot enough to scorch a feather. The reason raw oil does not answer is that it is too soft or does not dry hard enough, the boiled oil being more like a varnish. Raw oil also has not sufficient body.

The wood that is to be oil polished must be made quite smooth. Saturate the wood with the oil, then rub it down with brick or lump pumicestone, or even with steel wool or sandpaper. In case you should use either of the two latter articles, have the fine grade, as the coarse grade would scratch the wood. Wipe off the surplus oil after rubbing, as it must not be allowed to dry on the surface. Now the polishing is to be done. This is done by applying the oil and rubbing it into the wood with a piece of felt, an old felt hat doing very well, cutting small squares from it. Apply one coat only, letting it stand several days, so that the oil under it, as well as the last application, may have time to dry before more coats are applied. After each application of oil, and after rubbing, wipe off the surplus oil with a clean soft woolen rag. This is important, for the more time you allow for each coat to dry, the better the polish finish will be.

After thus securing a good surface proceed to rub it with the following: One quart of boiled linseed oil, 1 or 2 gills of alcohol, 1 to 2 gills of turpentine, and 1 quart of strong vinegar; the addition of a teaspoonful of butter of antimony will much improve the composition. Shake well until perfectly mixed. Rub the oil-finished surface briskly with a soft woolen rag wet with the polishing liquid.

This gives a high polish that will not crack, peel, scale, or check, nor will it be affected by water or ordinary usage. It is the most durable form of wood finish. This has reference to the formula just given,

and which may also be used on a varnished surface, such as a piano, etc.

SOME POLISH FORMULAS

A quart each of boiled linseed oil, turpentine, and strong vinegar, 1 gill of alcohol, and 1 ounce of butter of antimony. Place all in a stoppered bottle and shake well. Also when about to use shake well. This is one of the very best polishes we have.

For fine cabinet work this polish is recommended: Mix and shake well 4 ounces each of alcohol, strong vinegar, and turpentine, 1 pound of raw linseed oil, and 1 ounce of butter of antimony.

A polish for dark woodwork may be made upon the following formula: Orange shellac 2 ounces, benzoin 2 drams, and alcohol $\frac{1}{2}$ pint. Mix and keep in a well-stoppered bottle and shake now and then to prevent settling; keep in a warm place for a week before using it. To use it, first saturate the wood with boiled linseed oil, and rub it well into the wood, after which wipe dry with a clean muslin rag, then rub to a polish with shellac and a little oil on the rubber, as advised for French polishing.

To polish American black walnut apply the polish to the raw wood, after which, when dry, apply a coat of this brown shellac, rubbing this with a lump of fine-grained pumicestone until dry. Then apply another coat of the shellac, and rub as before. Then it is ready for the polish, which is prepared as follows:

Mix together raw linseed oil and turpentine, equal parts, with wax enough to form a paste; apply with a woolen rag rubber. If the surface, after rubbing with shellac and the pumicestone, is not smooth enough, smooth it up with fine sandpaper, then rub again with the polish.

For white or very light colored natural woods a good polish may be made by dissolving 6 ounces of white shellac gum in 1 quart of alcohol, adding 2 ounces of gum benzoin and 1 ounce of gum sandarach. Shake and place in warm place until dissolved.

For piano polishing take raw linseed oil 2 pounds, butter of antimony 2 ounces, and 8 ounces each of acetic acid, diluted, turpentine, and alcohol. Strong vinegar may be used in place of the acid.

Or this one: 20 ounces of raw linseed oil, 2 ounces of dilute acetic acid, 8 ounces of solution of sal ammoniac, and $\frac{1}{2}$ ounce of spirits of camphor. First add the sal ammoniac solution to the oil, then add the camphor and acid, finally adding the 2 ounces of alcohol. Shake after each addition.

VARNISH AND ITS USING

VARNISH is composed of linseed oil and such volatile fluids as turpentine and benzine. Hence in its using we should have a warm room and no drafts. Cheap grades of varnish may have little or no turpentine in them, and they are much more difficult of application than turpentine, or so-called oil varnishes. Shellac varnish is known as a spirit varnish because its thinning agent is alcohol; it evaporates very rapidly, hence must be used thin and applied very quickly.

Varnish should be kept in a moderately warm place, well sealed against the air, and not allowed to become chilled. In the latter case, where it has been kept in a freezing temperature, it will not flow easily, and before using it the can should be placed in hot water. When varnish has not been sealed tightly it will have lost some of its fluid and will not flow or spread well; warm it, and thin out a little with turpentine. The turpentine should be made warm.

Varnish is made for exterior and interior use; the former contains more oil than the latter. Spar varnish is the principal outside varnish. Never use an interior varnish on exterior work, and vice versa. There is one exception to this, as floor varnish, which contains more oil than is commonly used in interior varnish, does for the outside of doors, etc. Outside varnish contains rather more than twice as much oil

as interior varnish. Floor varnish contains twice as much oil as interior varnish because it has to be elastic, for floor use, and yet hard.

If your varnish cracks after becoming dry and hard, it may be due to one or more of several causes. Some try to hasten its drying by adding driers, and when such a varnish is applied to a surface that will be exposed to much heat, even to direct sunlight, it will crack. These cracks will be fine, like silk, but eventually they will widen out and become much larger. They cross in all directions, sharp and clear cut. Some varnish dries hard quickly, and has little or no elasticity. It is liable to crack. There are many more causes for varnish cracking, but they are too technical for general consideration.

A heavy bodied varnish is apt to crack on account of being too thick. Such varnish is not advised by the varnish maker, for he knows it will not give satisfaction. Better apply two thin coats than one heavy one.

When you buy varnish at the store you will find several kinds to select from, each one adapted to its own specific use. This is a great convenience, but at the same time it is well to know that one varnish will often do for several different kinds of work. Take, for instance, coach and cabinet varnish. They are practically identical in the making. If there is a difference it is in the former having better materials and more care in the making than the latter, which is what should be expected, seeing that a coach varnish is subject to much greater wear and tear, weather,

mud, etc. So, too, there are other varnishes that may be used for two or more different purposes, such as furniture varnish, which may be used for interior house varnishing, for agricultural tools, etc., as well as for furniture. However, it is advised that you get the varnish as it is labeled, coach, furniture, floor, spar, cabinet, copal, interior, etc. You may have to pay different prices for one and the same thing under different names.

The best all-round varnish is made from good copal gum, with turpentine and linseed oil thinners, and a drying agent. In color you will find it ranging from a light amber to a rich dark brown. The dark is as good as the pale, all else being equal. In fact, the dark is a harder varnish.

The hardest varnish made contains gum sandarach. The toughest varnish is made from shellac gum. The brightest varnish is made from gum mastic.

Old varnish will wear better than a new varnish, but on common work it is better to use the new, as it can be bought lower in price, or should be. However, it would be rather difficult to get just what you wished in this matter, and you might have to pay for old varnish and get new.

One coat of varnish never cracks.

Two coats seldom crack.

Three coats often crack.

Four coats always crack.

The above is an old shop dictum, but, like all such things, it has its exceptions. A single coat may

crack, though usually it will not, because of lack of body. Two coats do, indeed, seldom crack, yet they may. Three coats may or may not crack, depending on certain conditions, while four coats will not crack if the right varnish is used and the right method of application is observed. Indeed, as many as a dozen or more coats of varnish are, or used to be (for they dip now), given to piano cases, and they never cracked. So that it all depends upon circumstances. The general rule, The more varnish, the greater the liability of the cracking, is correct.

Varnishes differ in the time required for drying. Some dry within a few hours, while others will take several days. The varnish made for ordinary work will dry in twelve to twenty-four hours. The finer varnishes, owing to greater oil content, require much longer, some as much as seven days. A varnish that dries within two hours or so is a very poor grade, containing rosin and benzine. When varnishing have the right temperature, about 72° F., and when done let it have plenty of air, but not cold air. And see that dust or dirt cannot get on it.

There is a flatting varnish, one that dries with a lusterless surface, simulating the appearance to some extent of a rubbed varnish surface. This varnish is now variously made, but at first, and still so to some extent, made by adding some wax to copal varnish. It is used to a considerable extent, and with apparent satisfaction, giving a surface without gloss that would otherwise be out of the question with many,

owing to its cost, by rubbing. The home-made flat varnish may be made by shredding 4 ounces of wax to the quart of turpentine, and either heating this, or allowing it to melt cold, either way doing this, though it will melt faster in the hot turpentine. Then in another vessel have a gallon of copal varnish, and place this vessel in another one containing water, and place this on the back part of stove. When both are heated sufficiently they may be mixed together and well shaken. Let the varnish stand about two days, then it will be ready for use. Be sure to get the wax and varnish thoroughly mixed, this being effected by having all as warm as possible and shaking it well.

There are several other formulas, but this one is sufficient. The factory formula is quite different. In it no wax is used at all. Glue, for instance, is cheaper than wax, and there are other substances, such as Japan wax, China clay, etc.

Flatting varnish should be made thin and used thin to insure easy flow and an even surface. Use a soft hair brush. Avoid laps. Work rapidly with the brush. It is more difficult to get a nice smooth job with the wax flatting than with the factory made article. This is on account of the wax, and it is liable to give a ropy finish unless extreme care is used. It is by no means a durable finish.

SOME VARNISH NOTES

Give your varnishing plenty of time for drying.

Don't brush the varnish coating too much if you would have the most brilliant finish.

Thin or light-bodied varnish flows out well and does not show brush marks as heavy varnish is apt to do.

Your brush should be large or small, according to the dimensions of the surface you are varnishing.

SHELLAC VARNISH NOTES

Shellac varnish consists of gum shellac dissolved in alcohol. It is difficult to apply, but this may be somewhat remedied by adding to it a little Venice turpentine, 10 per cent. by weight, or gum camphor, at the rate of an ounce to the gallon of varnish. These harden or toughen the varnish also, besides making it more pliable and hence easier to spread.

Old shellac varnish is not satisfactory, being dull and spongy; add a little turpentine to it.

After using a brush in shellac it should be washed out in a little alcohol, or in warm water and soap. Shellac varnish may be removed with either alcohol or any alkali, even with soap.

The brush used in shellac should be set in glue, as alcohol will not affect glue.

Two thin coats of shellac are better than one heavy coat. Steel wool is better for smoothing a shellacked surface than sandpaper.

Be careful not to miss any place when shellacking, and in case you do, don't attempt to touch it up.

STAINING AND GRAINING

STAINING can only be done on the bare wood, and the brighter or cleaner the wood, the better the finish will be. Remove all marks with sandpaper, being careful not to scratch the surface or edges, using fine sandpaper and rubbing with the grain of the wood. Then remove dust with brush, and it is ready to stain.

There are vegetable, mineral, and aniline stains, the latter being more in general use than any others. But for some purposes the mineral stains, such as burnt umber to make walnut stain, sienna to make oak, and so on, are more desirable, for they not only give the desired color, but are more permanent than the anilines. But something depends upon the amount of exposure to sun or strong sunlight as to the durability of any color.

The mineral colors for staining are usually prepared with water, though in some cases they are mixed with oil or turpentine. Water is the more penetrating stain, and, of course, cheaper. Turpentine is next most penetrating, while linseed oil is the least.

There are on the market many very fine penetrating wood stains, and for general use are to be recommended.

Oil stains brush out best on soft woods, water stains do not, but on hard woods oil stain does not penetrate well, while water stain does.

The best mineral pigments to use with oil for stain are Vandyke brown, burnt and raw sienna, and burnt and raw umber.

If you choose to mix your stains, and want to use aniline dyes, get what is called water soluble, for there are some that will not dissolve in water. The anilines must not be used in metal vessels, but in glass, glazed, or porcelain.

The formula for mixing any of the water-soluble aniline stains is 4 ounces of aniline to 3 gallons of hot water; the water should be boiling, but the stain should not be used until cold. The addition of three $\frac{1}{2}$ pints of vinegar will greatly improve the stain.

It is necessary to be very deft and quick when applying water stain to the wood in order to avoid a cloudy or uneven effect. Don't go over a stained part twice, nor do any touching up. Have your brush full of the stain and make a good sweep with it, and so cover the surface that it will not require another brushing. Have a clear stain, and if you mix it then pass it through two or three folds of cheese-cloth. Don't saturate the wood with stain, for that will make it too dense, or not clear. Some prefer to apply the water stain with a sponge or with a cloth, but a brush is needed when doing moldings and corners, etc.

Oil stain does nicely on a hard pine floor, for the wood is hard in general, though it does have some rather soft places. For oak mix a little burnt umber with raw sienna, both ground in oil, and add a little

drying japan. Apply this with an ordinary paint brush, and with a cloth wipe off the surplus after the job has stood a little while; say, after you have done a certain space with the stain, and this will remove the stain from the hard or figured parts, except a very little, or enough to color the part, and the softer parts will be filled with it. This makes a very handsome finish. When dry it may be either waxed or varnished, or varnished and a coat of wax on that. The hard pine is done the same, though not always, for some prefer oiling it, and rubbing it well with the oil, which will be the finish.

Weathered oak may be effected with one of several methods, the simplest being with a solution of iron sulphate in water. Or 1 ounce of bichromate of potash in 1 pint of water, alternating with the iron sulphate solution, a coat of each. The iron sulphate is dissolved in an equal amount of water by weight. Let each coat be dry before applying the next.

The finish for weathered oak is shellac and wax.

Strong coffee gives a good stain for dark oak. Or oak may be darkened with an alkali, such as potash, soda, ammonia, fresh lime, etc.

Antique oak may be made with $1\frac{1}{2}$ ounces of powdered Vandyke brown in 1 quart of water, to which add 1 gill of aqua ammonia. Heat on the stove, then take it off and add to it a tablespoonful of turpentine.

The finest stain for golden oak is asphaltum varnish. Get the best grade, and rub it well into the wood, then rub off all you can with a rag.

A good cheap stain that is especially good for floors can be made by dissolving 1 ounce of permanganate of potash in 1 quart of hot water; apply it hot and freely. At first the color is a bright Magenta red, but this soon alters to brown. The effect may be made darker with two coats. When dry, rub it with wax or with boiled linseed oil. Another good stain, for the same purpose, may be made from 1 pound of Vandyke brown, dry, boiled in 1 gallon of water until it is reduced in quantity to two-thirds. Then mix 2 ounces of potash in enough water to dissolve it, then add it to the Vandyke brown. Apply two or more coats as to depth of color desired.

Sulphate of iron solution gives a yellowish brown.

The simplest black stain is made with Nigrosine black, an aniline, of which take 4 ounces and dissolve it in 1 gallon of boiling water. To get it jet black boil it longer. Ebony stain is made this way, but the wood is first filled with a black filler. When dry, smooth with fine sandpaper, then give it a coat of ivory black ground in japan (such as they use on carriages), thinned with turpentine; when dry, varnish and polish it. This is adapted best for hard woods, such as pear, apple, sycamore, and hazel.

A cheap walnut stain may be made with dry burnt umber mixed with a little vinegar; then mix 1 pound of dry Venetian red with a pint of asphaltum and 1 quart of turpentine, adding this to the vinegar preparation.

A nice cherry stain may be obtained with Bis-

marck brown, an aniline dye, 1 ounce to 2 quarts of boiling water, with 1 gill of vinegar. If too dark, thin it down with water. A cheap stain, suitable for some common work, may be made with 1 pound of dry burnt sienna and 1 pint of vinegar. Apply it liberally and wipe it off when done.

Rosewood stain is made in various ways. Dissolve 2 ounces of Eosine G, aniline, and 1 ounce of Nigrosine in 2 quarts of boiling water; when cold add $\frac{1}{2}$ pint of vinegar. This is a fine stain, and one of the easiest to prepare.

Fumed oak is produced by subjecting the raw wood to the action of strong ammonia fumes, both in an air-tight room or box, according to size of object. But an imitation may be effected by applying the ammonia liquid to the wood direct. The strength of the ammonia will determine the depth of color. This work ought to be done in the open, or where the fumes may be carried away quickly. Coat the surface quickly and evenly, and be careful that an edge is not allowed to dry before it is covered with the next adjoining part. It is advisable, as a rule, not to use too strong an ammonia, but to dilute it more or less, which will make it work easier and less liable to be spoiled.

Ivory drop black, ground in japan, and thinned down with turpentine; wipe it off with a cloth.

Weathered oak, mission oak, and fumed oak are by some classed under the same head, but the first is a stained wood, while the other two are fumed.

Early English Oak is similar in type to weathered oak, but it does not have to be filled. Weathered oak is simply stained and shellacked or waxed. Some shellac before filling, then give it a dull rub finish. There are some thirty different shades of weathered oak and fifty shades of Early English Oak, varying from bright umber to almost green. The best effect for Early English Oak can be produced by first staining it, and then applying a very thin coat of white shellac; then fill, shellac, and finally varnish and rub to dull finish. Some don't apply any varnish, but simply apply two or three coats of shellac, and thus get out of much rubbing.

The cloudy effect so objectionable in yellow pine stained with oil stain may be corrected by coating it with a mixture of one-third raw linseed oil, two-thirds turpentine, and a little drying japan. Let it stand twenty-four hours, then lightly go over it with a piece of fine sandpaper, size No. 0, after which the stain may be applied.

This must be done on the raw wood and not on the stained wood. Oil or water stain may then be used.

Old mahogany may be imitated with a weak solution of bichromate of potash in water, or by fuming. Weak lime-water will antique it, but gives it rather too reddish a tone. The antique effect may be had by means of a mixture of 2 parts turpentine and 1 part raw oil, well rubbed into the wood, afterward wiping off dry. Then apply a water solution of bichromate of potash; when this is dry, fill the wood

with mahogany paste filler. Finish as desired with shellac or copal varnish. Of course this antique work is done on real mahogany.

IMITATING WOODS BY GRAINING

This is different from staining, for the effects are all upon the surface, and the process has nothing to do with what is under the surface, only that it must be solid and properly coated with paint to receive the graining. It is, of course, well understood that only a very expert workman can do a first-class job of graining, but by the help of modern tools made for the purpose any handy man or woman may do very pleasing if not artistic work.

There are a few things of first importance in this work, namely, the surface to be grained must be even and smooth. It must be properly coated with paint, and this paint must be suited to the character of the graining that is to be done. This painted surface must be smooth and even, and, if anything, this point is the first in importance, for no matter how well a job of graining may be done, if the surface is not smooth it will not look nice. It is simply a matter of rubbing with sandpaper. But do not expect to do very fine work at first. There are some tools made for doing certain parts of graining that the amateur could not hope to do with the rag and thumb, as the experts do it. By deft handling of these rubber tools very satisfactory graining is done. A coarse and

fine rubber or leather comb is useful, too. The tools, outside of those mentioned, are few.

Having prepared the surface as indicated, paint it with the appropriate ground for the kind of wood you wish to imitate, as follows:

For oak the ground is made from white lead colored to a dark cream with yellow ochre tinged with burnt umber. A light oak will require a very pale cream; a darker oak ground has more ochre in it, also more umber. For walnut the ground is made from yellow ochre, to which is added white lead, Venetian red, and burnt umber, in proportions that will give a rather dark color, showing the influence of the ochre and umber. Any of the light colored woods, such as maple, etc., can be done on a pale cream ground. The rule with grainers is to make the ground color the same cast of color as the lightest part of the wood.

The graining colors you can buy ready for use, in 1-pound cans, in oil. Directions on the can will explain how they are to be mixed for use. If there



were paints put up for the graining grounds it would be a great convenience.

In almost all cases the householder will want to imitate oak when he undertakes this kind of work, and while oak is about the hardest to imitate well,



yet it is the most popular as a wood, and also as to its imitation.

The graining color must be rubbed out to a thin glaze on the groundwork, and be laid very evenly. Don't make too ambitious attempts, do nice plain work and you will get better satisfaction than when you try to do extra fine work.

RENOVATING FURNITURE

It is a mistake to apply too much polish or liquid in the renovating of furniture, especially if it is not well rubbed off at the finish. Most revivers and polishes contain more or less oil, and while the purpose of the oil is to brighten, yet if it is not well removed when done with the rubbing it forms a sticky film that catches dirt and dust, and is hard to do anything with unless it is removed. When the furniture is in good condition it requires merely a cleanser, and nothing is better for the purpose than an acid, such as strong vinegar, which may, of course, be used with a little oil and turpentine. Formulas for making all sorts of revivers, cleansers, and polishes will be given further on in this article.

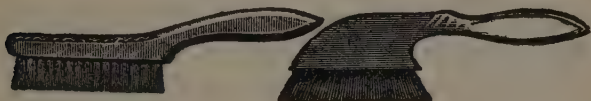
The condition of the furniture indicates the line of procedure in renovating it. All dust and grime should be removed, to begin with. A damp cloth is best for taking up dust, as then it is not simply transferred to another place. Any removable parts, such as handles on sideboards, should be removed and be made clean; soaking in strong soda water will soften up any old varnish. After removing the old stuff from these parts, brighten them by rubbing with metal polish or by any other means that will answer the purpose, but do not replace them until

the object from which they have been taken has become dry after the polishing or varnishing, as the case may be. It may happen that some repairing is needed, in which case this will first have to be attended to. This work will prove very costly if sent away to the cabinet-maker, and hence, if possible, do the work at home. It may need a piece of veneer where some of the original has been knocked off. If you happen to have an old piece of furniture that has some veneering of the same wood you are in luck, for a piece of it can easily be removed and transferred to the object you wish to mend. Cut out the old piece to fit a like cut-out in the new object. The edges of the veneer may be trued up with a file, and after gluing the piece into place and rubbing a little color over it the repair will not be seen.

A slight bruise may be remedied by wetting it with warm water, which will raise the sunken part to the level of the general surface, after which, and giving it time to dry, it may be lightly rubbed smooth with fine sandpaper. A deep bruise will require more time and trouble, but it, too, can be remedied. If the hot water cure fails, then fill it with a compound of sawdust and glue size, making it into a sort of putty; a little color should be added to give it the color of the wood or finish as nearly as possible.

However, this kind of work calls for a handy man, many homes not being fortunate enough to own one, in which case the furniture will have to be sent away for repairing. Very slight bruises may be re-

moved by placing wetted blotting-paper on the bruise and then pressing it with a hot flatiron; the heat and dampness will bring the sunken parts to the surface level. If there is only a small bit of veneering



broken off you can make a putty of the same color as the finish on the wood, and with a flat knife or putty knife press it into the part and neatly level it over; when it becomes hard dry a light sandpapering will make all even and smooth. The putty may be made from whiting, but white lead will do better. Mix to a stiff paste and add some color, burnt umber for walnut, Venetian red for mahogany, and raw sienna with a little umber with it for oak.



Old furniture, where the varnish has become dead and crumbly, will have to be sandpapered or scraped, or both, to remove the dead varnish. It is easily removed. After its removal sandpaper the object until the last vestige of the old varnish is gone and the surface is smooth. Then dust it off and go over it with some raw linseed oil and turpentine, about

twice as much of the former as of the latter, and add a drop of japan. Now if the object is oak, you will add some yellow ochre and a little burnt umber to it for light oak, or just the umber if for dark finish. Rub this liquid well into the wood, and then rub it off well. This brightens up the wood and gives it its original color and appearance. Let the work stand until dry enough to rub with very fine sandpaper, being careful about the edges and corners that you do not rub off the color. After this a coat of furniture varnish may be applied.

It is always best not to use water in cleaning furniture for renovation, as the water may get into little places and not be dry when you come to put on the finish. Where handles, etc., are on bureaus and sideboards, etc., after removing them, there will be dark and unclean spots, which may be made clean by the use of turpentine or gasoline, or varnish remover.

There are many renovators, polishes, etc., on the market designed for cleansing and brightening old or new furniture, for even the latter requires brightening up once in a while. A favorite one is wax, which may be beeswax or some other sort of wax, all good enough for the purpose. Beeswax is more expensive than some of the others. People like wax because while it gives a very pleasing finish it is also easily applied, and as readily renovated when necessary. When it is desired to remove the wax for refinishing take turpentine and a coarse rag, burlap is good, and

rub it until the wax is soft, and can be entirely removed.

A wax finish is very pretty, but it is not so durable as certain other finishes, say shellac, for instance. Wax will spot when water lies on it, in which case more wax must be applied and rubbed well into the spot.

There are many liquids on the market that do good work, but in many cases they cost more than the nature of their contents warrants, though perhaps not more than it costs to make and market, with the various profits to be considered, as from maker to jobber and retailer, etc. An old favorite formula is simple vinegar, raw linseed oil, and turpentine, in about equal parts, all well shaken just before using. Oxalic acid is used in some formulas, but as this acid is a dangerous poison, it is not to be preferred to strong vinegar, or to acetic acid, which is similar to vinegar. Acid has a decided action on varnished work in removing any grime or dirt, and as it does not affect the varnish it is preferable to more powerful liquids, like benzole or varnish remover, alcohol, etc. These soften varnish, and, in consequence, are not safe except in the hands of the expert, being liable to cut the varnish. Benzine is a good harmless renovator, but where water is not likely to get into joints and open places of any sort in the furniture it may be used, with soap.

A very fine reviver or renovator is made from equal parts of vinegar, turpentine, alcohol, and raw

linseed oil; place these ingredients in a bottle in the order given; this is important, for otherwise the mixture would curdle and be spoiled. An old time renovator is known as Derby cream, and was once highly regarded and much in use. It can be made by adding 3 ounces of acetic acid to 6 ounces of raw linseed oil, stirring well together, then adding 1 ounce of butter of antimony (antimony trichloride) and 3 ounces of alcohol. Butter of antimony, by the way, is an ingredient of many such renovators.

For renovating the piano case there is nothing finer than the following formula: Have a large vessel containing some hot water and in it set a smaller vessel, and in this latter vessel place $\frac{1}{2}$ ounce each of white beeswax and powdered white rosin, with $\frac{1}{4}$ dram of Venice turpentine, stirring until the mass is dissolved. Now pour the mass into a larger vessel, and while still hot stir in 5 quarts of turpentine. Let it stand for two hours or so, or until it assumes the appearance of vaseline or butter. The object that is to be renovated must first be made clean, then the polish may be rubbed on with a soft rag, afterward polishing with a bit of soft felt.

Another wax polish may be made by melting some white wax in turpentine and melting in an earthen vessel covered to keep in the fumes, and guarding against fire, 3 ounces of turpentine to 4 ounces of wax. Allow the mass to become cool, then stir in 2 ounces of alcohol. Mix it well.

Here is another, though you perhaps have too

many formulas already! Melt together, with a gentle heat, $2\frac{1}{2}$ ounces each of white wax and Castile soap, and 10 ounces each of turpentine and boiling water, and 1 dram of potash carbonate. Melt the wax and turpentine together, and dissolve soap and potash in boiling water; while the mass is still hot stir in the wax compound. After removing the compound from the stove stir occasionally until it is cold to prevent granulation of the wax.

Slight scratches on varnished work may often be removed by simply rubbing raw linseed oil over the part, then rubbing the part clean with a rag.

Experts renovate old rosewood furniture or piano cases with the following: Place in a pan 2 ounces of yellow beeswax, $\frac{1}{2}$ pint of boiled linseed oil, and 1 ounce of liquid from boiled alkanet root; place the pan in another and larger one, which fill two-thirds full of boiling water and leave it until the wax has melted and is well colored with the alkanet stain. Then strain it, and when cool add 1 gill each of vinegar and turpentine; after mixing well together it is ready for use. This will improve any dark wood, like mahogany, walnut, etc.

To clean and renovate old oak furniture dust it clean, then wash it with Castile soap and warm water, then allow it to dry. Then rub on a thin wax polish with a soft rag, and with another rag, woolen by preference, rub to a polish.

Any plain varnished surface may be rubbed to a nice polish with the palm of the hand, the heat gen-

erated by the friction and the natural oil of the hand combining to produce a superior polish. Piano finishers use this method when they want to give the work an extra fine touch, though they use some fine lampblack usually.

Splashes of dirt on polished furniture may be removed with soap and water; then let it dry, after which it may be rubbed with a mixture of equal parts of alcohol and raw linseed oil; or turpentine may be used in place of the alcohol, which is usually apt to do harm in inexperienced hands. This liquid cleanses and polishes, and the finish will remain good for quite a long time if well rubbed in and the surplus rubbed off clean.

HOW TO HANG WALL-PAPERS

It is a virtue of wall-paper that it is capable of hiding an unsightly wall as no other form of decoration can, while it also possesses the additional advantage of decorating a room in a quick, cheap, and attractive manner. There are some walls that are so rough and bad that it would be impossible to either paint or water-color them to any degree of satisfaction. On such we find paper the only decorative resort.

At the same time, where the surface is in good, smooth condition and paper is preferred a better job can be obtained than where the surface is not so good. If coated with lime until in scales and roughness, this must be scraped off, and while perhaps not all can easily be removed, where any parts remain they must be leveled or smoothed off so that no edges will show. All cracks, large or small, must be filled with plaster of Paris, and when dry be sandpapered. If you paper over a crack the paper will break there. The corners of the room where the side walls meet, also the angle of ceiling and wall, must be filled if open.

After doing all these things well, next apply a coat of thin glue water, which will make the wall surface solid, and prevent suction in soft places.

In the above directions it is understood that the

ceiling is included with the walls; both are one in case both are to be papered. Some prefer water-color on the ceiling, but more often both ceiling and walls are papered. My own preference is for a coat of good calcimine, or of oil paint, on the ceiling, when the sides are to be papered. The seams of the paper show more than on the side walls, and as it is out of the question for the inexperienced to butt or neatly join the edges of the paper together, and thus show no seam, it may be better to calcimine the ceiling. The color should be one that will be in harmony with the most prominent color of the wall-paper. Thus, if the paper shows much blue, a cream or creamy yellow ceiling will look best therewith. Or if the paper is on the buff or yellow order, then the opposite color, on the blue tone, is more suitable. Almost always white agrees well on a ceiling with any color paper on the walls. This because white is, like black, a neutral color. Thus in two colors that do not harmonize adjoining each other, harmony may be restored by dividing them with a line of white or black; gold will do the same thing.

If the wall you are to paper has been painted with oil paint, the paper will not stick well, as the surface is hard and oily. The same when papering over a varnished surface. In such cases the surface will have to be scratched with coarse sandpaper, to give a tooth, as it is called, to the surface for the pasted paper to adhere to, but the expert adds some molasses to his paste, or, as I think a better way, a little Venice

turpentine. This may be bought at the paint store; it is a sort of thick turpentine. A tablespoonful to the bucket of paste is right.

If the walls have been calcimined and are in good condition, with the calcimine hard and sound, you can paper right over them; but, as a rule, it is safer to wash off the calcimine, but no sizing will be necessary afterward.

If the walls have old wall-paper on them, it had better be removed, and the walls washed off in warm water, but no sizing will be necessary afterward. The old paper may seem tight, yet when the pasted new paper gets on it will soften up the old, and the new, while adhering to the old, cannot, of course, adhere to the wall, and will be loose and unsightly.

But the best argument for removing old wall-paper is founded on its sanitary aspects. We need not go into argument, for the fact is too obvious for that.

If it is desired to paper a very bad wall or ceiling you will first have to line it, which means the putting on of plain wall-paper, made for that purpose, and costing much less than printed paper, but being of the same stock. Or if you have or can get printed wall-paper at a low price, it will answer as well, and the printed be pasted, thereby showing the plain side. Lining walls and ceiling is sometimes required on account of certain colors used in the paper being damaged by contact, indirectly, with the lime of the plaster. Ingrains especially are thus to be protected, to prevent "burning" or lime injuries.

Some wall cracks may be covered with muslin, which will save time, but plaster is more permanent.

New plaster walls are always caustic and require treatment to prevent paper from leaving the surface, or from injuring the colors in the paper. Two or more coats of vinegar are sufficient to kill lime.

I forgot to say under the proper heading that in order to "sweeten" the walls after removing old paper apply a hot solution of alum, made pretty strong. This will kill vermin, if any, though a solution of formaldehyde may be better, as destroying disease germs as well as vermin.

Greasy or smoked walls must be washed clean with soap and hot water.

To remove old paper the means will depend upon the condition of the paper. A layer or two may be soaked through with hot water in

Small Wall Scraper. a little time, but even this will depend on the condition of the wall surface and whether it has been well sized with glue, and also the strength of the paste that was used. A single application of hot water is sometimes enough to make removal of paper very easy. At other times it may be necessary to give it many applications, and allow it a long time to soak in, before scraping can be begun.



First of all try the old paper before wetting it; there will be corners and other places where the paper has come loose, then a pull will remove sheets of it. In this way much of the paper may be removed without water, while the rest can then be treated with the hot water and scraper; there is a wall-paper scraper sold for a few cents.

Where it is found very difficult to get the old paper off with hot water you had better get a wash-boiler in the room and fill it with boiling water; close doors and windows tight, to keep the steam or moist air in. With this aid you may, with hot water and scraper, more readily remove the old paper.



There are some heavy papers, such as imitation leathers, and also varnished papers, which must be treated with a caustic, to soften and remove the lacquer or varnish, after which the hot water may be used. Wall-paper Scraper.

NOTES

It is important when cleaning off and preparing walls for wall-papering to see that all the surface adjoining door and window frames, etc., be made perfect by cleaning and glue size. If your edges hold,

then the rest is bound to. Paste such parts well also, to make sure.

Two thin coats of glue size do better than one heavy coat.

Cheap dark glue is generally used for sizing walls, and does very well, but I would advise a better grade, as being sweeter or more sanitary size, and goes farther than common glue.

Glue size gives a good foundation for papering on, and in some cases two coats are advised. To insure coating every part add a little color to the size, say dry yellow ochre, for if you miss a place it will show up white, being uncoated.

Don't use paste for size unless on a sand-finish surface. Nothing better than a glue size.

The wall does not require to be hard in order to hold the paper; as a rule a little suction in the wall surface is an advantage, but it is better to be on the safer (for the inexpert) side and glue the surface all over and solid.

Making Paste.—For all common wall-papers there is no paste better adapted to the purpose than that made from the best wheat flour. Rye flour makes a stronger paste, but excepting where an extra strong paste is required, as for certain heavy wall coverings, the wheat is best. My own method of making wheat flour paste is by taking 2 pounds of best wheat flour and mixing it to a smooth stiff paste with some lukewarm water. It pays to spend some time making this batter free of lumps, for it will give a clear smooth

paste that will require less time in the application to the paper than one that is full of small or large particles. With the batter thus prepared, next pour slowly into it, and stir constantly with a medium broad paddle, boiling hot water, until the mass has swollen to a thick paste. Add still more boiling water until thinner, but not as thin as you will require it when you get to using it. This because you may not need it all, and by only taking a certain quantity out of the bucket at a time, having a second bucket for the purpose, and thinning it up for immediate use, the remaining thick paste will keep better and for several days in moderately cool weather; in warm weather add some formalin to it to preserve it.

Do not add too much water when making the paste, as I have already indicated, because it will cause it to go "watery." If you have some remaining in the bucket, unmixed, cover over with water. This will prevent drying of the surface of the paste.

To make rye flour paste, mix the flour with cold water until the mass has the consistency of thick cream; then pass it through a fine sieve, after which place it in a vessel and set it on the stove to boil. Stir it occasionally, and see that it does not burn. When sufficiently cooked take from stove and stir in some cold water until it becomes like cream; then let it stand until it is cold. It is then ready for use by thinning with cold water.

A good paste for paper that is to go on old white-washed walls is made the same as the usual wheat

flour paste, but be sure to have it well cooked and not too thick; then, instead of thinning it with water, use skimmed milk that is free of cream.

Paste for heavy goods like burlaps must be made stronger with glue; 1 pound of good strong glue to 4 pounds of wheat flour is the formula. Add to this paste, after it has been made, 2 ounces of Venice turpentine. This paste is intended for all heavy papers.

NOTES

Don't use starch paste, as it is too non-elastic and will crack certain grades of paper when drying out on the walls, and it isn't as cheap as flour.

Rye flour is cheaper than wheat, but as it gives a very dark paste it is liable to soil fine paper.

Use thin paste for cheap papers, and stout paste for costlier and heavier papers. Use stout paste for rough walls and thin paste for hard walls.

Prepare paste enough for the work you are to do, as it is better to have some over than to stop and prepare more to finish out with; paste should be cold when used. If you find the paste running low, don't thin out with water; better make some more. Two pounds of good wheat flour will make 2 gallons of paste ready for use; this should do an ordinary room, ceiling and sides.

A little alum in the paste makes it firmer, causes it to spread better under the brush, preserves the paste from souring, and the wall-paper from molding on damp walls; it also causes the paste to dry out

quicker, an advantage with certain papers. But do not use it to excess; use about 1 ounce to the pail of paste, or even a little less.

Alum should not be used in paste intended for papers printed with bronze, gilt, etc., as it will cause such to tarnish. Nor should alum be used in paste intended for hard walls.

Hanging Papers.—You will need a kitchen table to cut, trim, and paste paper on. Also a pair of 10-inch shears to cut and trim with. Such shears will find many uses in the household when not required for papering. Two pairs would be better, for then you could have one pair where you are hanging the paper and one on the table. However, one will do. Next you will need a dry smoothing brush for brushing out the paper when affixed to wall or ceiling. A good household dust-brush, washed clean, will do, in lieu of the paperhanger's brush. Then for pasting you can use that good calcimine brush we told about. Or, failing this, a good whitewash brush will do. Now if you have a nice clean muslin rag at the table, for wiping pasty fingers with, and one at the hanging place, for the same purpose, and for wiping the shears now and then, you will be ready.

To prepare the paper for hanging, take the roll in your left hand, and with the right hand unroll it to about the length you require; say 7 feet, 6 inches, or less or more as the case may be. First you will have measured off a strip at the wall, from top to bottom, allowing something for the border. The paper is

laid face or printed side up, and the figures studied. There are two kinds of patterns in wall-papers, the straight and the drop. In the former a half-figure is on the right edge of the paper, with its corresponding half on the left edge of the paper; when you find this is the pattern all you will have to do when cutting off the strips is to lay these half-figures on top of each other. With the drop pattern there is no half-figure on the edges, so that when cutting into strips you must move the paper down half-way between the figures. Those small dots on the margin or selvage of the paper show the size of the pattern. If it is a 12-inch pattern, drop pattern, you must move the paper down 6 inches, or half-way between the figures, to make the match.

It is easier to cut the straight pattern paper, as has been shown. Your guide is those small drops that are printed on the margins; on a drop pattern cut between the drops, and on a straight pattern cut on the dots. That's easy.

The reason for this is that paper may be saved. If you do not follow this rule and cut at random you will cut to waste. Another good idea is to cut drop pattern paper from two rolls, the first cut from one roll, the next cut from the other roll, and so on.

Arrange the paper before pasting, so that you will not risk hanging it upside down. Some papers have such patterns that it is difficult to tell which is the right side to hang up. Here is a guide: The end that you begin unrolling is the top, and hence must

be hung that end up. English paper, however, is the reverse of this. At least, almost all English wall-papers come upside down, as compared with American.

After all these points have been taken in you may begin to cut off some strips; some cut enough for all the room, but better not cut more than a dozen or so at a time, for certain reasons that need not be gone into here. Now there are several methods of removing the selvage from the paper; there are trimming machines, which will not interest you. Then the edge may be trimmed with the shears, by laying the roll upon another roll, across the lap, and trimming as you unroll the untrimmed paper, and rolling it up as it is trimmed. This is dry trimming. Then you may first paste and fold the strip on the table, and trim it in that condition. The latter method has the advantage that the edges cut are well pasted, while the trimmed paper may not get their edges so well pasted. Also, the pasted edges of the ready trimmed paper may have too much paste, which will squeeze out and soil the adjoining paper.

The pasting is not unattended with some difficulties for the beginner. He or she will likely find the paper apt to roll up under the paste brush, but with patience and further experience the work will become less difficult.

The common or ordinary grades of paper are easiest to manage. You do not have to be so careful about spotting it with paste or hands as with more expensive goods. You can paste three or four strips at

one time, that is, one at a time without leaving the table to hang up. These strips are then hung in rotation, the first pasted the first hung. As you paste the strips they can be hung over the backs of chairs or elsewhere. Start hanging from a corner of the room, toward the light, so that the lapped edges will not show. Hold the strip at its top edge with both hands, and look down its edge and get it to match the figures on the preceding strip, and while still holding with the left hand carefully fasten down the edge for a distance, then take your dry brush and sweep the paper down the center, then sidewise from the center outward. Smooth it all this way, down a little way, and then get down from your step-ladder and brush the paper down to the washboard. Fasten the edge against the washboard, then take it up with the left hand, and with the right hand with the shears cut it off along the line that has been formed by contact with the washboard. Then fasten the edge down.

If you venture to hang the ceiling resign yourself to a hard and possibly impossible task. Perhaps it would be better to calcimine it. The expert can hang more paper doing ceiling work than wall work because it offers no difficulties to him, and he finds no hindrances, such as door frames, etc., to trim around. But the amateur will find it much more difficult than side walls, these being hard enough for those inexperienced to some degree.

In hanging walls see that the first piece is hung

plumb, which can only be determined with a plumb bob, which may be a small weight and a piece of twine. Then keep it plumb by trying the paper once in a while.

Borders are wide and narrow; a frieze is the width of the wall-paper. A narrow border is easily applied. A wide border looks best when hung to a true level. A good plan is to run a chalked line across the wall and hang from this, the line being next the ceiling. Get it as near the ceiling as may be while allowing space enough for the line not to get beyond the ceiling angle. If the ceiling and walls form quite perfect angles there will be no need for a line run.

To paste border don't do more than you can hang from the top of your step-ladder. Paste it and fold it. Here I should say, as I forgot it elsewhere, that wall-paper is pasted, then folded, each end as pasted, leaving only a small space in the middle exposed.

NOTES

To miter a border first fold the paper at right angle, before pasting; the crease made will show after pasting, when it may be cut there.

After a strip of wall-paper has been pasted it should have time enough to become wet through, or nearly so. If wet through and the paper is printed in soft color it will be apt to rub up and so spoil the appearance.

Have a basket or some receptacle to throw bits of pasted cuttings in; don't throw them on the floor.

To paper over wooden partition you had better first cover it with cheese-cloth or light muslin, made into sheets large enough to cover each large space. Sometimes only the cracks or joints of the wood strips are covered with muslin, being pasted on. Over this, then, a lining paper will help.

If you attempt hanging an ingrain paper, remember that the edges must be cut true and be joined together by butting, as lapping them mars the effect. As it sometimes occurs that the edges pull away from each other in drying, leaving the white plaster to show, it is well to first run a strip of water color where the two edges are to join the color of the paper as near as possible.

The Sanitas class of wall coverings require the same kind of paste that is used on ordinary wall-paper. The main difficulty the inexpert will find is in the width of these goods, otherwise they are as easily hung as paper. But the walls should be solid and non-absorptive; size with two thin coats of glue size on new plaster walls, or one coat of thin paint. On ordinary old walls the surface thereof should be the same as for wall-paper.

Crown decorations come ready cut out. To paste, first paste a strip of paper with heavy paste, and lay the cut out on it and press it evenly with a dry cloth.

SOME PAPER-HANGING NOTES

Should you venture to hang an ingrain paper, which is much wider than ordinary wall-papers, use

a rather stout paste, and be careful not to get any paste on the face of it. I have hung many rolls of ingrain without trimming it, but the rule is to trim. If the paper has not been abused on its ends or edges, you can perhaps get a better job without than with trimming, for as the two edges have to join or butt, they have to be very true; you could not trim this paper true.

Ventilate the room after papering it, or the walls may sweat and spoil the paper. But in wintertime don't open the windows for ventilation. The paste should dry within a few hours in ordinary temperature.

To canvas a room, using cheese-cloth, sew together strips enough to form a sheet that will cover a certain space, whether large or small. Tack along the top edge first tacks 2 inches apart, stretching tight as you go; then tack down the right-hand side, then the left, then the bottom, always stretching tight. Before papering over this give it a size of glue-water. This will stretch it as tight as a drumhead when it dries. Paper on it as on plaster walls.

Never let your paste brush lay on the strip of paper as it lies on the table; it will stain the paper by acting on the colors.

Never use sour or old paste, as it will not hold well, and it will stain the paper; also it is unsanitary.

Have your paste smooth, free of lumps big or small, and you will do better work. Any little bit of wood or what not will show up through the paper.

DECORATIVE NOTES

Good taste goes a long way in decorating a room, but the observance of certain rules governing the art will be found of great value. First, consider the location and purpose of a room. A room with a northern exposure will be the better for warm coloring, which indicates yellow in its various tones. The room on the south side should be done in cool colors, blue representing this scale. Added to this come the furnishings, such as carpet or rugs, hangings, etc. All should harmonize in coloring, and the papering also, of course. Dull colors make a room appear dull. This because such colors absorb light. The colors are the browns, greens, blues, and reds when in their dull tones. Yellow reflects the light, hence causes a room to look warm and bright. Then there are some neutral colors, such as the tans, the buffs, and cool grays.

A room that is not much furnished may have paper showing color and floral designs abundantly. Such paper furnishes a room. But if there are pictures to adorn the walls a plain paper, like ingrain, is best. A paper with stripes apparently increases the height of a room, hence low ceiled rooms are helped by such a design. A paper with a small pattern makes a room look larger than when a large figure is used. A too high wall may be lessened in height by bringing the ceiling paper down say 18 inches or so.

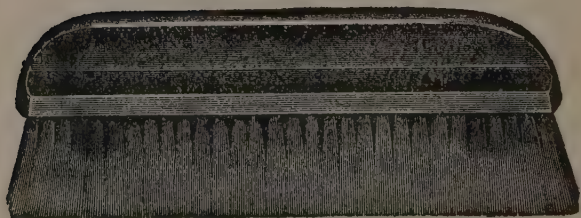
Plain paper makes a room look larger, provided the paper is of a light color. A plain dark paper has the opposite effect.

To make a northern room appear bright and warm it is not necessary to have everything on a warm color plan, though the paper should be; have some contrasting colors showing cool tones in the rugs and hangings. The same with the southern room, where the paper is on the cool order, have some bright touches of color to liven up the effect, relieving the cold aspect.

White is the strongest reflector of the light, cream color being next, with ivory white third. Yellow is lower in light-reflecting power than any one of the others named, strange as it may appear.

THE TOOLS USED IN PAPER-HANGING

THE tools necessary for hanging wall-papers may be few or many, but the housewife doing her own papering can get along with very few, and will find



a pair of shears, a dust brush, a paste brush, and step-ladder about all she will require. The shears

should be 10 inches in length, though 12 inches would be still better. The measurement covers the entire length of the shears. The dust brush should be perfectly clean, and, if not, then it should be washed with soap and warm water, and then dried. If the bristles are a little short it will not matter. The paste brush may be the calcimine or whitewash brush, the latter doing very well. The paste should be made and used in a metallic bucket, for if used from a wooden bucket the paste may sour in warm weather or if left too long in a warm room. Ordinarily the wooden bucket does.

A step-ladder will be needed for reaching the upper part of the walls or for the ceiling, if one. If the walls require cleaning of paper a scraper will be needed. There are several kinds of this tool, two of which are here illustrated. The long-handled one is handy for reaching upper parts without using the step-ladder. The short scraper is handy for nearby parts or for any part if the step-ladder is used.



A small pointing trowel, costing but a few cents, will be found useful for filling cracks with plaster. For large cracks and broken plaster what is called wood fiber plaster is handy, it being composed of ground wood and plaster of Paris evidently. It is

mixed with water to form a thick paste, and then may be applied with the trowel, as described, or by means of the plasterer's trowel, if the space to be done is rather large.

Should there be loose plaster on walls or ceiling the



edges may be fastened to the lath by means of screws, with a tin washer, screwing through the



plaster into the lath, the washer preventing the head from breaking through the plaster. These

fasteners may be bought ready for use. The cracks around the broken plaster may then be filled with plaster.

The paste brush, or another brush, such as a common whitewash brush, can be used for sizing the walls. If you do use the paste brush, wash it out well when done, and let it drain out before putting it into paste. After you have finished the job of papering wash the paste brush in clear warm water until the paste is entirely removed from it. Then hang it in a cool, dry place.

HOW TO CALCIMINE

As calcimine, or kalsomine, variously spelled, comes in packages ready to be mixed with water, hot or cold, as you wish, for it makes no practical difference, it is hardly necessary to give instructions regarding its preparation. However, this will be done, for it is sometimes necessary, as where the prepared article is not accessible.

Any handy person, man or woman, can do a good-looking job with this material by carefully following directions. Its application is different from that required with whitewash, and it is, of course, rather more trouble to do. With the latter coating any sort of surface may be used, but with calcimine a good one must be had or the work will look ill. The surface should be hard and smooth, and clear of stains of any kind, for they will show through even three or more coatings.

Say the wall or ceiling has never been done with anything before, unless with wall-paper, which must be removed and the surface washed clean. A thin coat of white glue size should be given to make a good solid foundation for the water-color, as we sometimes call the calcimine. The best surface, however, is one that has been painted, as it is hard and solid, but if it is a rather dark paint it will require

two coats of water-color where one would do on a plain plaster ceiling in order to overcome the darkness. Whenever conditions are such that one coat of calcimine will give a nice job it is better than two coats, and if the first coating does not prove right, it may be washed off and be done over again. If a second coat must be applied, see that the first one is perfectly dry before you apply the second. Then there is danger of rubbing up the first coat, but this may be averted by giving the first coat a coat of strong alum-water. When this is dry, apply the second coat of calcimine. Sometimes a weak glue size is used instead of alum.

Calcimine may be applied either cold or warm, but it is better to use the cold form, as then the calcimine is in a jelled state and makes a better job, not being thin like warm calcimine. It should be thick or jelled, and in this condition it works "cool," as the expert says, or freely. One coat of this will almost always be enough, but with warm or thin calcimine it will certainly require two coats. Even then you do not get a solid-looking job as with the jelled.

Use a regular calcimine brush, a wide flat-bristled



one. It will cost some money, but you can't do a good job with a whitewash brush. The calcimine brush will do for whitewashing and sizing walls, etc. When done calcimining with it wash it out in clean cold or lukewarm—never hot—water, and put it through several waters, until every bit of the calcimine, which is a form of lime, is out of it; then hang it up to dry, and when dry hang in a cool, damp place, but not too damp.

To do the ceiling, after it has been made ready, work from a good step-ladder, and take a stretch across the ceiling, at its narrowest part, the stretch being about 2 or 3 feet wide; by taking a narrow stretch you get across quicker and avoid making laps where the edges become more or less dry. The room should not be too warm, and as the ceiling part is always the warmest, heat going up, it is best to have no fire in it, unless in winter, though in winter this kind of work is not often done.

Work the calcimine out even and smooth, laying it criss-cross, not as with paint, which must be laid out in straight, parallel lines. This gives the job a solid look, which straight work would not do.

When starting on another strip across the ceiling work the stuff well over the adjoining edge, and so avoid a lap. Work quickly, and when the job is done let the room have air, but not too much heat, so that the ceiling will dry moderately, yet not slow.

In using the calcimine brush work the tips, rather than the whole length of the bristles, for this gives a

better finish in laying it smooth, yet with a certain amount of roughness, which tends to give the effect of smoothness and solidity. Work the brush with a free hand, not with a stiff motion, and be careful not to leave any thinly covered or uncovered places. You cannot touch them up afterward, but will have to do the job over again.

Start working away from the light, not toward it. This will give you the light on the work before you. If the calcimine dries too fast for you, let in more cool air, if possible, or open windows and doors. Calcimine may be made "cool" for summer use by the addition of a little Irish moss, about which see in another place.

Start the walls in a corner of the room, at the top, working down, in a strip not wider than you can manage without laps forming. Work from right to the left around the room.

When a lap occurs wet it with cold water and apply the calcimine on the adjoining strip at once, coating over the wet part. This must be done while you are working on the part next to the lap; it must not be left until the wall is done.

The quicker calcimine dries after the work is done, the better, within reasonable bounds of course. If too long in drying the work is apt to show spotty or cloudy, especially when a dark tint of calcimine has been used. The best time for calcimining is in clear weather, when it is neither hot nor cold. The worst time is in wet weather.

To Do a Sand-finished Wall.—To calcimine a sand-finish wall first go over it with rough sandpaper, very coarse size, which will remove all loose sand and lumps. Fill any cracks with plaster of Paris and thick slaked lime, equal parts, with clean sharp sea sand. Cut out large cracks and key them, so that the plaster will not fall out; wet the parts with water. With a float made like that used by plasterers (a small block of wood will do) go over the surface where the plaster has been applied, and rub the plaster in a circular way in order to give it a smooth surface. A piece of Brussels carpet tacked to the bottom of the block, and a sort of handle to the top, will make a very good tool. Finer cracks may be filled with plaster rubbed in with this float, but in this case the surface should first be sized with the soap-alum-glue size described in another place. Rub the size well into the cracks. After the size is dry you can rub in the plaster, which may be made like paint, with water; apply this with a brush. When all is dry the repaired parts will be like the rest of the surface.

If the surface is clean and sound one coat of calcimine will give you a good effect. A sand-finished wall in good condition needs no size. If more than the one coat is desired or necessary, let it be a very thin one for the first coat, and with a rather medium coat for the second, but the one regular coat should be enough, and it will give a better effect than two, as it does not obscure the sand finish as two do.

The best brush to use is a heavy pattern, though the one used on smooth walls may also be used on the sand finish.

Imitation Sand Finish.—This is done on a painted wall, with a bellows and clean dry sea sand. The paint must be heavy and the sand be blown on while it is in that condition. Apply all the sand that the paint will hold, and when perfectly dry brush off all loose sand and apply a thin coat of glue size. When this is dry, apply a coat of calcimine.

This gives a clever imitation of the sand finish.

CALCIMINE NOTES

The package calcimine has full directions for preparing and using the stuff, and these should be carefully read and adhered to, not deviating a bit.

Calcimine should always be used in the jelled condition. If it contains too much glue it will crack and peel. If too little, it will rub off, and in damp weather it will flour off.

If the calcimine, after having been mixed, is left standing in the cellar or other cool place until the next morning it will have time to jell. In warm weather a small bit of ice added to it will help it cool and jell. It may be stood in a refrigerator.

In warm weather it is well to add to it a very few drops of carbolic acid, or formaldehyde, or alum—experts often use alum in calcimine, in all seasons, mostly to harden it—and borax is good.

To prevent too rapid drying in warm weather add a little Irish or Iceland moss size to it. It causes it to work freer and to avoid laps, and also tends to hasten the jellying.

Make the calcimine fresh each day if more than one day is required for the work, as calcimine left over night, after having been used from during the day, is never quite so good as the fresh.

Don't mix calcimine in a wooden pail, nor use it from one in warm weather, as the wood takes up water, etc., and this is apt to sour and spoil the calcimine. Mix in and use from a galvanized pail.

Calcimine is better for straining before using to remove any small particles and possible bits of wood, etc., all of which would prevent a nice smooth job, and if left to work out on the job would have to be picked off, taking time. Calcimine can't be strained through cheese-cloth, like oil paint, but must be passed through wire of a proper mesh.

HOME-MIXED CALCIMINE

If you wish to prepare your own calcimine, and it will pay to do so if you have much of it to do, buy whiting known as Gilders' Bolted Whiting, a grade used for making putty, and will give very good results as calcimine. It is also cheap. Sift it before using, to remove possible foreign bodies.

To mix, take the whiting, weighed or measured, the former way the best, and place it in a vessel and pour cold water over it until the water covers it. Let it stand some hours, say over night, and in that time the water will have saturated the dry powder perfectly, making it easier to mix. If any water is standing on the surface of the whiting the next morning, pour it off. This wetting of the whiting may be done in an hour or so in daytime if you prefer.

Use the best white glue, that in very thin sheets, and, having weighed out the required quantity, place it in a suitable vessel and pour cold water over it; in a short time the glue will have absorbed all the water it is capable of, and will become much swollen. Then it may be dissolved at once with boiling water. Strain it. About $\frac{1}{2}$ ounce of glue to the pound of whiting is the rule, but, like all rules, this too has its exceptions, something depending on circumstances.

Taking, say, 10 pounds of whiting, and having sifted it, stir into it the glue-water, and work it with a paddle until the mass is quite free of lumps and all unevenness; make it smooth, though if you pass it through a strainer after mixing that will remove all particles, etc., and give a fine calcimine.

Poor glue will not jell calcimine well, and also will fail to hold the whiting in suspension, allowing the heavier portion to sink to the bottom of the bucket. The best of whiting contains more or less heavy or coarse material, and always you may find some in the bottom of the bucket when you are done. It is well to stir the calcimine once in a while when using it.

If you wish to use some color in the calcimine, as often is done for walls, also for some ceilings, mix the color by itself in water, strain, then add to the mixed calcimine before adding the glue. Add a little color at a time, and try the calcimine once in a while, to see what color you have.

A good way to ascertain just what the colored calcimine will look like when dry is to wet a piece of paper with it and dry it over the stove or lamp flame. That will show what the color will be when put on the wall; wet calcimine always looks several shades darker than it will be when dry. The best colors to tint with come in glass 1-pound jars, ground in water. Or you can get dry colors and "break them" in water, if you prefer. After mixing in the color, strain the calcimine, which will break up any

particles of color remaining. This is very important, because the smallest particle of color working out on the job will cause trouble.

In mixing the calcimine add a little water at a time until you get it right, and this will be when it is medium thick, due allowance having to be made for the subsequent jellying. In general terms it may be said that the calcimine should be about like heavy oil paint when ready to set away to jell. If you should have occasion to thin the calcimine a little when using it add cold water only, and a very little will be plenty; you are apt to get it too thin by adding too much water.

If you add water to the dry calcimine then add it by degrees, for if you dump it in at once it will be very difficult to mix. Use a rather broad paddle. Work the stuff against the sides of the bucket to remove the lumps and form a smooth paste.

Never let the calcimine brush stand in the calcimine at any time, but when done with it wash it out.

Both hot water and cold water calcimine are hard on bristles; wash out in warm water having a little borax in it, and rinse well, after which hang up to drain.

The brush that has been used in whitewash is not fit to use in calcimine unless every bit of the lime has been removed from it. A brush with bristles 4 or 5 inches long and 5 or 6 inches wide will be a very good one for calcimining with.

If you would like to try hot water calcimine here

is a good standard formula, used by an expert decorator:

Sift 8 pounds of Gilders' Bolted Whiting and add to it 2 quarts of hot water, boiling hot, and mix to a smooth paste. In the meantime have in soak 4 ounces of the best white glue in 1 pint of cold water, and when it has absorbed all the water it can hold, pour off excess of water and replace same quantity with hot water; this will dissolve the glue, when you may stir it smooth and then pour into the whiting and stir until the mass is smooth. This will make about 12 pounds of calcimine, or a half-pailful. This calcimine should be applied at once. It may be tinted with color as desired. A gray may be made with lampblack; as this is a greasy pigment, add a little borax to cold water and mix the black therewith. Or a little hot soapy water will do.

If the calcimine seems too thin it may be set away to jell, or another time use less water, say one-half.

Here is another practical decorator's formula: To 8 pounds of best bolted whiting use 8 ounces of best white glue and 8 ounces of powdered alum. Place the whiting in a pail and pour on it enough water, hot or cold, to saturate it. Place the glue in a vessel and cover the glue with cold water. Dissolve the alum in cold water, and when all is ready mix the alum with the glue size; add this to the whiting, stir with a paddle, after which pass the whole through a sieve. Set it away to jell, after which it is ready to apply.

This last formula differs from the preceding one in having alum. Alum gives what the expert calls a false body to the calcimine, and hence some don't like it on this account, but most experts always use a little alum in calcimine. This last formula gives a calcimine that when cool is about like thin jelly.

To make damp-proof calcimine take 16 pounds of Gilders' Bolted Whiting and mix with 1 gallon of boiling water. Dissolve 4 ounces of sodium phosphate in 1 pint of boiling water and stir it into the whiting mixture. Have ready at the same time a solution of $\frac{1}{2}$ pound of good white glue in water, 2 quarts. Add this to the calcimine while hot, and stir all together until the mass is perfectly smooth and free from lumps.

Ordinary calcimine may be made partially waterproof by adding a solution of 1 ounce of chrome alum in 10 fluidounces of water. An ounce of this solution is sufficient for 1 pound of dry glue; or, roughly speaking, for one pail of calcimine. Also, formaline may be used for the same purpose. Add 1 part of 40 per cent. formaline to 99 parts of water, and add 1 fluidounce of this to the pound of glue used. Both of these solutions act upon the gelatin contained in the glue, hardening it, but as the gelatin content in glues varies, care must be had not to add too much, as that will make the glue or gelatin perfectly insoluble. Add the solution carefully, trying the calcimine as you proceed.

What is called oil-water calcimine may be made

from 10 pounds of whiting, $\frac{3}{4}$ pound of glue, $\frac{1}{2}$ pound of sal soda, and 1 quart of raw linseed oil. Dissolve the soda in a pint of boiling water and stir it into the oil, then place the mixture on the stove and bring it to a boil, and keep it there until the mass has become saponified. Stir in the glue solution now, then mix all with the whiting. Melt the glue as has been explained in previous formulas before adding it to the calcimine.

One of the popular wall paints on the market is that known as flat wall paint. A similar one may be made in this manner: Make up a liquid as follows: Dissolve 2 ounces of sal soda or the same of powdered borax in 2 quarts of water, which should be hot. Add slowly 8 ounces of crushed white shellac; stir it, and gently simmer just under the boiling-point until the shellac dissolves; this will take about thirty minutes. Then strain through cheese-cloth. When nearly cold add 1 ounce of glycerine, 3 of denatured alcohol, and 12 of cold water. This solution will mix either with oil or water paint; it causes the paint to flow and spread easily under the brush, and prevents settling. To make the calcimine flat wall paint stir in whiting till the mass is of the required paint consistency, though rather thick, then add a little raw linseed oil and turpentine. Stir well.

Here is another and similar formula, but it gives a paint having rather more gloss than the first. Mix 25 pounds of Gilders' Bolted Whiting with $2\frac{1}{2}$ gallons of water; let it stand over night, and in the morning

pour off surplus water, then mix with the whiting 1 gallon of boiled linseed oil. Mix thoroughly and it will come to a thick whitish paste, and then it can be thinned for use with raw linseed oil and turpentine. Either of these paints may be tinted any desired color that is not affected by lime.

A better grade of paint is made by the following formula: Mix together 40 pounds of bolted whiting, 10 pounds of dry zinc white, 10 pounds of white lead in oil, 8 pounds of raw linseed oil, 6 pounds of brown soap, and 26 pounds of soft water. A quart of copal varnish will improve it. Mix the dry pigments and water to form a paste or pulp, then mix the lead and oil together, then add the two mixtures together, thinning with the water, to which the soap has been added. This gives about 100 pounds of ready mixed paint.

HOW TO SIZE WALLS FOR CALCIMINING

USUALLY a thin glue size does for the walls that are to be calcimined, but then walls are not all alike; a strictly first-class plastered wall would hardly need any size, as it would be hard and with no free lime. But modern walls are soft, uneven of texture, and hot, or very absorptive, so that in order to get a solid, even surface the plaster must be filled. The expert looks over his walls and then decides upon the kind of size it requires.

Here is one of the best sizes the decorator knows of, and we will call it the S. A. G. size. It is prepared as follows: Soak a pound of good white glue in a quart of cold or warm water, and when it has taken in all the water it can, pour off the surplus water and pour in on the soft glue just enough hot water to melt it. In another vessel shred and melt 1 pound of good white soap in hot water; in a third vessel dissolve 1 pound of powdered alum in just enough hot water to dissolve it; about a quart of water to both soap and alum does. Then mix together the glue and soap waters, stirring well to get the two perfectly mixed, then stir in slowly the alum-water, stirring the whole. Finally, add enough hot water to thin the mass to the consistency of thin syrup.

When a quick job is desired, or when a very white

job of calcimining is to be done, a size made from brown soap or from soft soap is applied to the walls. This soap size is made very stout or strong. Soap always forms an oleate of lime with the plaster and renders the surface waterproof, and, of course, very solid to apply water color to.

Common glue size may be made with brown glue. The granulated glue is the easiest to prepare, as it will melt with hot water at once, whereas, with the sheet glue it must be soaked until soft. Just how much glue to use in making size for walls cannot be stated for the reason that walls differ, and hence require different sizes. One pound of common glue to the pail of water would be very strong, yet some workmen use it that strong, but usually for very dry walls. About one-fourth that much would do on average walls, but by testing the glue-water between thumb and finger a fair idea can be had of its strength; it should have a slightly soapy feel.

Glue size is not the best for calcimining on, as the water color is liable to work up the soft glue coat. Better use a harder size, like the soap-alum-glue size, or some one of the following described sizes.

A varnish size is often used, and may be bought under the name of ceiling or sealing varnish. Or it may be made from rosin, 10 pounds, melted in an iron pot, then add 2 quarts of raw linseed oil, and bring the mass to a boil; then add 1 pound of air-slaked and sifted lime, stirring this into the liquid very gradually. After a little while the mass will

look like a mixture of molasses and flour. Take up a little of it and let it dry; if it appears very brittle, remove the pot from the fire to a safe distance and stir a gallon of benzine into it, but be careful that you are far enough from the fire—better take the pot outdoors and the benzine too.

Water stains on walls may be sized with a mixture of equal parts of boiled linseed oil, turpentine, and drying japan. When the walls are dry apply a coat of shellac, very thin, and when this is dry give it a coat of white lead paint. If the stain is not very bad a coat of thin varnish, followed by a coat of lead paint, will do. This is for the stains only, not for the entire surface, and the stains are always on the ceiling if anywhere, caused by water soaking through. The lead paint prevents the calcimine from scaling on the varnish.

For a greasy spot or entire ceiling, as in that of a kitchen, make up a thin mixture of plaster of Paris and water, with a little glue size in it, and apply to the greasy part. This size should be as thick as calcimine and should be applied as soon as ready.

Vinegar is useful on whitewashed walls when to be calcimined or papered, as it kills the lime.

Water-glass, diluted to half its strength with water, is a good size for plaster walls before painting with either oil paint or water color. It forms with the lime in the plaster an insoluble lime silicate. Apply with a fiber brush, as water-glass is hard on bristles.

When you size the walls or ceiling of a room see that it is at least comfortably warm and dry, and that the walls, etc., are not damp.

Sometimes the area around the chimney where the stove-pipe enters is badly smoked, and this must be remedied. First brush off the loose smoke or soot and then wipe off with a dry cloth. Next wash off with water having some ammonia or sal soda in it. Finish with soap and water. Lime-water is good for smoked or greasy places. The smoke will stain through several coats of calcimine, and hence must be removed.

To remove old calcimine it is only necessary to wet the old stuff until it is saturated, when it will be a soft pasty mass. Use hot water and scrape with a broad-bladed scraping knife; a piece of sheet zinc is best, as it will not cut the plaster. But be careful when scraping not to mar the surface of the wall. Some old calcimine is very thin and rotten, hence may be washed off. To get it from moldings, etc., cut a bit of soft wood to correspond to the moldings and scrape with that. Every bit of the old stuff should be taken off if the walls are to be recalcimined.

STENCILLING AND OTHER DECORATIVE EFFECTS

WHEN the ceiling and walls of your room have been nicely calcimined, and that they will be there is no doubt, of course, there remain a few decorative touches to do, thus finishing the picture. A neat border may be run around the room atop the walls. This may be wall-paper border, but a very narrow, say an inch or so, of plain tinted paper will do very nicely. Some old rolls of paper you may have, and they may be in striped pattern, so that from these you can cut out plenty of neat and narrow borders. The writer has the whole of his second story done in calcimine with a border such as he is describing. But if you have no old wall-papers at hand, then get some from the wall-paper dealer, who always has a lot of old stock on hand that he will be glad to sell at a very small figure. It is one of the problems of his what to do with such stock, for there is not enough of one pattern to do even a closet, and the rolls won't burn, so that he would in most cases be glad to give the stuff away.

Then there is the neat stencil pattern, which may be bought for little, and will last as long as you wish, if taken care of. Some run the border around windows and door frames and above the washboard, a

modern idea. It looks nice and helps decorate and even furnish a not overfurnished room. The color of the border, either stencil or paper, need not be anything like the calcimine, but it should not be too dark or too light in color. A very narrow border looks better than a wider one. In fact, I like the 1-inch border, no matter what the size of the room.

Stencilling may be done with a water color, but it is rather difficult, and we would advise you to use a paint color, one ground in japan and thinned out with turpentine, for that will not spread and discolor the calcimine. The color is mixed rather thick, for if too thin it is going to run under the stencil and make a blurred effect. Use a regular stencil brush, and work it by dabbing, the most usual manner, though some experts rub in straight lines, or every way, the method depending on the character of the stencil and its design, matters that hardly interest the amateur. The principal thing is to get a clean-cut effect, with no color under the edges of the stencil plate.

Be careful when placing the stencil on the place that is to be done, set it accurately, having the notches in it to give a "key" to work by; or it may have little holes for the same purpose. These are at the ends of the plate, or at the center, borders being notched at both ends to a line corresponding with the edge of the border. For panels, the stencil should show at least one angle corresponding with an angle of the panel. To fix the stencil plate to the surface

needle points are better than thumb tacks, making smaller holes. To make a good pin for holding a stencil plate in place take a needle and place it in a spool, and wedge it there with a piece of soft wood. When you use ordinary small stencils you will not need to fasten them to the wall.

To use a stencil brush, handle it with a quick, light movement, dabbing it against the plate or stencil. Work in any broad places first, while the brush is filled with color, then work in the smaller places with the drier brush.

If you want to apply a wide stencil you can attach a frame of light wood by gluing it to the stencil. This is almost necessary when the work is done on a ceiling. If you use water color in stencilling, the edges of the stencil plate may become clogged with the color, and this must be removed by washing off carefully, then it will have to be hung up to dry.

If water color is used in stencilling, a sponge in place of a brush will be useful, as you can get softer effects that way.

Another way to use a stencil is to lay it on the freshly painted groundwork and wipe out the color, which is the reverse of the other method. Wall-paper makers use this plan in producing hand-work friezes and fillings. Finer effects can be got this way than by any other method of stencilling. Here is the way to do it: A colored ground is prepared on the surface that you wish to print on, usually paper or canvas, and the stencil is placed in position; you

then wipe out all those parts you wish to have lighter than the ground. The colored ground, it should be stated, forms the dark background of the pattern, and, it may be explained, it need not be the same color all over; it may be graduated from one color to another. You may wipe off a little color so that the pattern is only dimly seen on the ground, or you may wipe away vigorously so that the ground is cleared of its color, and the pattern made a distinct light on the dark ground. So far you have only a monochrome effect, but while the plate is still in position you may stencil fresh and different colors on to the wiped-out parts, so that the effect produced is a colored pattern on a dark ground. The ties of the design may be so arranged as to form the dark outline of the pattern, or you may go further, and make ties form the whole of the pattern. Added color may be darker than the ground as well as lighter, so that the free use of this process will give the widest range of effects it is possible to get. The design will be light on a dark ground. This description applies only to water color work, as it would be difficult to do in oil colors successfully.

STENCILLING THE ROOM

Borders or friezes stencilled on paper, then hung on the walls, look well, and are easier to do than direct to the walls. Or the frieze or wide border stencil may be fastened to a frame, as has already

been described. Another plan is to attach the upper part of the stencil plate (paper stencil, of course) to a lath, which is to be a little shorter than the stencil plate. Stencil all flat places first, doing all the stencilling you can before doing the corners. Center any figure at the chimney breast. At the corners the stencil will have to be without the lath or frame, because it will have to be bent into the corners. That is why it is best to do all you can before doing the corners, which may break the stencil more or less.

A room hung with plain or texture wall-paper, with a properly stencilled frieze, the colors of which tone with the paper, will look very fine. Marine or landscape effects in atmospheric tones can be worked as easily as the simplest conventional design. Use water colors of course.

A great advantage of hand-painted friezes lies in the fact that the design can be adjusted to fill a given space; this wall-paper cannot, of course, do. Very rarely do printed designs come exactly right in spacing around the room, hence we must space the design. Nearly all frieze designs have a central feature where the design is most pronounced. The usual form of frieze is to have a design which repeats from a central line, one side balancing the other. It is necessary to have these principal masses spaced evenly. It would be inadvisable to have this part of the design break across a corner. For that reason each wall should have the main features of the design spaced apparently equal distances apart, and an

equal distance from the angle at each side of the wall.

The wall should first be measured, and the length of the frieze space divided by the width of the repeat of the design. Say the wall is 13 feet long, and the design is 12 inches from center to center. This means that if a start were made from the middle of the wall the design would be exactly right and would finish at each end of the frieze exactly the same distance from the angle on each side; but if the design, instead of 12 inches from center to center, were 9 inches from center to center, it means that the design would repeat 17 times in the frieze space; there would be also 3 inches to spare. That is to say, if the design were stencilled exactly as it repeated one would reach the finishing corner with 3 inches to spare. This would not be much out, but to make it exact one would require to work off the odd 3 inches by gaining about $\frac{1}{4}$ inch each time the stencil plate were lifted. If the repeat were 10 inches, it would occur 15 times on the 13 foot wall, and would, besides, give a 6-inch space at the end. In this case instead of gaining 6 inches in the 13 foot wall, it would be better to lose 4 inches by putting the repeats closer together each time the stencil is lifted. By thus losing 4 inches there would be sufficient room for another repeat in the space at disposal. In that way the surplus space is worked off and the design may finish at the corner exactly the same distance as it started from the commencing corner.

It should be stated that before beginning to do the stencilling a line should be snapped at the top of the wall from which to do the work. This will give you a straight and even line all around the room. Where walls and ceiling meet it is seldom a true line, hence the importance of the line. Take a carpenter's chalk line and rub it with whatever colored chalk will make a distinct mark on the wall. Either have some one to assist you in this, or drive in an awl or brad and fasten the line thereto and carry the other end to the end of the wall and give it a snap.

Mention having been made about stencilling in the corners, it may be well to add that there are other ways of doing it. All stencil plates, no matter what the design, are liable to break, and some patterns more so than some others, a diamond or angular pattern being the worst. Better have two stencils, one for the plain surface, the other for the corners, the end of the work, or elsewhere.

There may be some mitering to do, as when doing panel work. Slip a piece of clean paper with one straight-edge on it under your stencil, on the miter line. Now stencil the first half and slip your clean paper over this finished half-edge on miter line, and set stencil so that it will make a true miter. Or bend the stencil by placing a ruler over the mark where the bend is to come; slip your hand under the stencil and bend it gently upward, press the fold firmly to a right angle, and it will slip into the corner nice and snug, without breaking, after which bend

the stencil straight again. When going around a projecting corner don't bend the stencil, but finish one side first, and then turn the stencil over and finish the other side of the corner.

The tools required for stencilling are few in number and not costly. Two stencil brushes should be used, one 1 inch in diameter, the other $\frac{1}{2}$ inch larger. Clean them with soap and water when done using them, and wrap in paper, tied with string, to keep the bristles straight. A straight-edge and chalk line, with a 2-foot rule, will also be necessary. Then for some parts of the work not always done, however, especially by an amateur, there will be needed some sable pencils, fitch brushes, lining brushes, etc.

SOME STENCILLING NOTES

Try the stencil on some paper before beginning on the wall; this will show you how it works and how it will look when on.

Wipe off the stencil plate when done using it, and wipe off the back of it during its use, to insure clean work. Have a piece of clean oil-cloth on a table near your work, lay the stencil down on this, and gently rub a wet sponge over it; turn it over and do the other side. Then remove the moisture by means of a dry rag or blotter; this when using water color on stencilling.

Where the stencil contains leaves and flowers it is not necessary to have more than the one plate, for

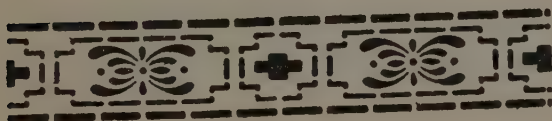
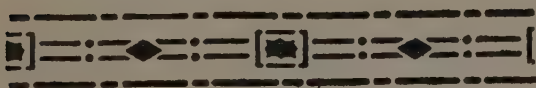
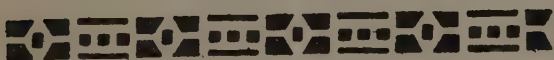
you can dab on each color with a separate brush, being careful not to get one color on that part that is to be done with another color.

In stenciling a wall start in the middle of the most prominent side, and work both ways toward



the corners. Sometimes the corners are done in a different pattern. Do not continue an ornament around a corner; omit it unless the center or end of the ornament will just fit in the corner.

Gold paint can be used on calcimined work. You can prepare the gold paint yourself by mixing the



best grade of gold bronze with shellac varnish, which must be thinned out with alcohol.

To get a stencil color that will harmonize with the walls add to it a very little black until it agrees with the body of the room. There should never be a harsh contrast between the stencil color and the color of the walls.

On an oil and lead painted wall a nice effect may be obtained by stencilling with varnish, and after the varnish has almost dried, when it still is tacky to the finger, dust on bronze powder with a wad of raw cotton. Don't apply the powder until the varnish is nearly dry, as it does not require much tack to hold the bronze, and the latter will show much brighter that way; if applied when the varnish is wet it will drown the bronze, which will dry with no luster.

STENCILLING ILLUSTRATIONS

The first illustration represents a 17-inch ceiling decoration, with the corner, and adjoining this is a handsome centerpiece, made to go with the border or



ceiling decoration. The next illustration shows a series of simple band borders for the top of the side walls, in width ranging from $1\frac{1}{4}$ to 10 or 12 inches. The last illustration shows a stencil brush, of which there are various sizes.

WHITEWASH, ITS PREPARATION AND USING

SINCE the advent of hydrated lime it is no longer necessary to use the lump lime, which involved not a little bother in its preparation. The hydrated lime is in powdered form, and all that is necessary is to place sufficient of it in a pail and stir in some cold water. Hot water was best with the old method. From my own experience with this new and very convenient lime it answers the purpose of a whitewash quite as well as the slaked lump lime, so that the old Government formula for making a good lime wash is in the discard. No other formula I think ever was more called for nor oftener printed in answer to correspondents in certain family papers. So, too, the various formulas that called for lump lime are discarded now.

The addition of salt or alum may harden the wash and thus improve its wearing qualities, with the hydrated as with the lump lime. However, it may be dispensed with, but when the lime is to be applied to damp walls or cisterns it will be found useful to add salt, say a handful, to the bucket of lime. The formula for lump lime whitewash was about 7 pounds of salt to $\frac{1}{2}$ bushel of lump lime. The coarse salt was used. I have never used or advised the use

of glue or rice flour paste in whitewash, though such things may produce a better effect on exterior walls by giving the lime coating a fuller and better surface.

For exterior use the whitewash may be colored with any earth colors, which are immune or unaffected by lime, but too great a quantity of pigment will tend to weaken the wash. Green copperas is used to produce a buffish color, and it does not weaken the wash, besides which it increases the disinfectant qualities of the wash, desirable when doing a cellar and cellar stairways. Bluestone gives a good blue color, and also is a disinfectant. A little blue, ultramarine blue or bluestone, makes the white look whiter by removing the yellow cast.

A whitewash having some of the appearance of calcimine may be obtained by adding raw linseed oil at the rate of 1 pint to the 6 quarts of thick lime wash. Or the oil and turpentine equal parts to make 1 pint. Stir it into the whitewash, then add 8 ounces of powdered alum. Color if desired. This wash may be used inside or outside, as it is more or less waterproof, something like paint. For inside work rather less oil or turpentine would do.

Skimmed milk added to lime wash makes a very fair coating for exterior walls, wood, or plaster, also buttermilk; I have known of it lasting well for several years on a frame house, or quite as well as ordinary paint. Some add 8 ounces of flour paste to the pail of whitewash.

When salt or alum is added to whitewash the wash

should be applied at once, as otherwise the lime with its ingredients will lose strength. In the old method of preparing lime from the fresh lumps, whereby the lime, in slaking, generated considerable heat, beef tallow was added, and this made a very durable coating too. The fat unites chemically with the lime, forming a sebate of lime.

We have given two substances used for coloring whitewash blue or buff, and for other colors the following list will be serviceable:

Black: Use dry powdered drop or bone-black.

Brown: Use burnt sienna, burnt umber, and Vandyke brown. Add some umber or Vandyke to the sienna to produce the desired shade of brown.

Red: Orange mineral or a bright oxide red, or iron paint, or Venetian red.

Green: Use terre verte or green earth, or oxide of chromium green.

We would advise the purchase of a good whitewash brush, the best you can buy. Or a calcimine brush of good grade. While the cost of such tools is rather high, it will pay in the long run if you take proper care of the brush; it will do your work for several years and give satisfaction. It is poor economy to buy a cheap brush.

When you get the good whitewash brush twirl it between the hands, which will throw out the loose bristles, always present in even the costliest of brushes. Don't condemn a brush because a few bristles come out, though if too many drop out

return it to the dealer. Next pour a little varnish into the bristles near the wood, then hang it up for a few days until the varnish has become dry. Then it is ready for use. After done using it wash it out well with plenty of cold water, then hang it up to dry in a clean, cool place, the cellar being a good place, or the cellar-way. Never clean it out with hot water. Never let the brush stand in lime.

Should your whitewash brush become dry by not having been kept in a place where it is moist enough to prevent the drying of the brush stock, simply soak it in water for a little while, which will swell the wood around the bristles and tighten the latter.

HELPFUL INFORMATION

Color Terms Defined.—*Color* is any one of the Primary, Secondary, or Tertiary colors. *Hue* relates to a particular tone of a color, as purple-blue, orange-yellow, etc. A *Tint* is produced by adding a little color to white. A *Shade* is obtained by adding black to a color.

The words or terms “Gray” and “Grey” are the same, but in painting we call that gray which is produced by tinting white with a little blue, red and black, some adding a little yellow to warm it a bit. This is the formula generally used in making French gray. Grey is made by tinting white with a little black.

A *Hot* color is one that suggests warmth, or fire, and red is, therefore, called a hot color. A *Cold* color suggests ice, and is represented by blue. A *Warm* color suggests sunshine, and yellow, therefore, is known as a warm color.

The Primary colors are Red, Blue, and Yellow. From these all other colors are formed, though there should be included white and black, without which we should be unable to get many of our most used combinations or tints.

The Secondary colors are made from the Primaries in the following manner: Red and Blue produce

Purple; Blue and Yellow give us Green; Yellow and Red form Orange.

The Tertiary colors are derived from the three Secondaries, as follows: Orange and Purple form Russet; Orange and Green form Olive; Green and Purple form Citrine.

Green is generally regarded as a cool color.

Black and White are called neutral colors.

There is a great diversity of qualities in the pigments used in paints, and when buying a can, say of yellow ochre or burnt umber, or any of the colors used in house painting, it is advised to get that made by a reputable manufacturer, though even here we may go astray from the fact that there are sometimes two or even three grades put out by the same maker. Of course, the idea is right enough, for it is intended that people shall get that which they feel they can best afford to buy, but the ordinary householder does not know these things, and takes that which is handed out. As an illustration of quality, there are American ochres and umbers, etc., as well as French ochre and Turkey umbers. The latter are the best grade, the former the poorer. Then the grinding differs; grinding color is a very costly process, and the less a color is ground, the less the cost, of course. And also it requires less oil. But for most painting one must have a color that has been ground fine as butter, if possible, some colors not being susceptible to such fineness as this. White

lead also should be ground fine, because it will spread better and wear better than a coarse-ground article.

Green is one of the most used colors, and as there are two processes for making a green it is well to understand them. The green most commonly used in house painting is called a bottom green; it is made by mixing blue and yellow together. This gives a handsome color, but it will not last under exposure to the sunlight. The two colors separate, the blue becoming almost extinct, leaving a dirty yellow behind. The other green is called a chemically pure green, and is made by a chemical process too tedious to relate here, but which briefly may be explained as a result of chemical action of a certain chemical upon a base. It does not separate as does the yellow-blue compound, though it is not entirely fast to sunlight. It is the best that can be done in making a green for exterior house painting.

Chrome yellow darkens in air containing sulphur, as has been noted respecting white lead, for this yellow is a lead color. Prussian blue fades, as has previously been pointed out. Vermilion tends to darken owing to its sulphur content, it being a sulphide of mercury; there are several vermilions, so-called, but the true vermilions, Chinese and English, are the ones we have in mind as being made from mercury. Vermilion paints when exposed to the weather should be protected by varnish, which will prevent the weather and gases of the air from affecting them, though the sun will tend to bleach them.

All pigment colors will be more or less affected when exposed to the air or weather, but some are more permanent than others. Generally considered, dark colors are more permanent and have greater capacity for service than light colors. Of course, those colors that contain aniline dye cannot wear well.

Bath-tub Enamel Paint.—This can be bought ready for use, and some brands are perfect paints. On the other hand, some are poor, but it is simply a matter of paying the price as a general thing.

This enamel paint is made from French zinc white that has been ground in pure damar varnish or other suitable light color varnish; this may be mixed with turpentine, after which stir in some best white enamel varnish, but not damar varnish. This is a high-grade enamel paint.

Mixing Dry Pigments.—Whether in oil or water it is difficult to mix dry color. If with oil, pour the oil over the dry pigment enough to cover it, then let it stand until the oil has soaked through the pigment, when it will mix easily. The same with water color, though in this case the pigment, if not in large amount, may be mixed with a little vinegar, this especially with lampblack. To mix a dry pigment such as red lead, for instance, and lampblack together, place both in a vessel and shake them together until perfectly intermixed.

Painting Over Calcimine.—When the calcimined surface is sound and it is not desired to remove it

before applying oil paint, first give it a coat of thin glue size, using white glue for the purpose. Soak the glue in cold water until it swells, showing it has absorbed all the water it can; pour off the water, place glue in a vessel and pour a little boiling water over the glue, which will dissolve it; 4 ounces of glue will make a bucket of size.

To Repaint Window Shades.—Stretch the shade on a frame, or against a partition wall, or other suitable place, and see that it is smooth and even. The paint is made from white lead, colored as desired. The less oil the lead contains, the better, and only turpentine is added to thin the paint. Use a tablespoonful of japan to the 2 quarts of paint. Dry colors are better than oil colors for this work, because you want as little oil as possible, the shade to finish perfectly without luster. One coat should be enough, for the least paint that will do will make the better job. Apply the paint criss-cross, and not in straight lines, for by putting the paint on every way it will have a more solid look than when applied the other way. You can tell machine-painted shades by the straight streaks of paint; hand-painted shades are to be preferred.

Paint for Golf Balls.—Take 1 part of dry pulverized shellac, 2 parts of denatured alcohol, and 1 part of lithopone, all by weight. Mix the shellac and lithopone together and place in a bottle, then add the alcohol. Shake it now and then until the gum shellac has become dissolved.

Making a Glue Varnish.—For certain purposes this varnish will prove very satisfactory, as it will wear well and stand anything that ordinary varnish will, to a great extent. For light colored varnish use white glue of the best grade and dissolve it in 1 quart of water. For dark varnish use a best grade dark glue. This is now the varnish, but it is not ready for use until you add to it $1\frac{1}{2}$ ounces of bichromate of potash; this must not be added until you are ready to apply the varnish, for the glue-varnish with the bichromate in it will in a rather short time become hard and useless. It hardens the glue and makes it more or less waterproof.

Disinfectant Paint.—Such a paint will be found useful upon occasion, as where a sick room is to be renovated after removal of the patient. Carbolic acid may be added to ordinary paint, though it will change the color some, especially white. Boric acid and salicylic acid are useful and will not change the paint. Any color, or white, may be employed with these acids.

Flat Finish Varnish.—The varnish that dries without gloss may be made by heating 6 ounces of beeswax in a vessel until it melts, and in another vessel make warm a gallon of hard-oil finish, which is a varnish. Stir the melted wax slowly and carefully into the warm varnish, after which stir in 2 ounces of raw linseed oil, which will cause the varnish to spread easier when you apply it and not show laps. Add also some turpentine to thin the varnish to a working

consistency. Strain all through a doubled cheese-cloth; use a clean varnish can and brush. Do a small space at a time.

Old Ivory Imitation.—Two coats of white shellac varnish are to be applied to the surface you wish to treat, and when dry spread a thin coat of raw umber over it, this being known as scumbling, after which places here and there are rubbed off, giving it a mottled effect. Very simple and makes a pretty effect.

Safe Paint for Toys.—The paint that is used on toys which little children are to handle is non-poisonous and may be made as follows: Pulverize to a powder 6 parts of chalk and add to it 3 parts of calcined magnesia; this makes a white paint, but it may be made to appear much whiter by the addition of a little soluble laundry blue, the quantity not sufficient to prove injurious should the child suck the paint. This white powder is to be mixed with white glue to form a paint.

Green Paint for Lawn Furniture.—Medium chrome green does fairly well when some varnish is added to it, or when the green paint is mixed with turpentine, so that it may afterward be varnished, using a good spar varnish. Emerald green is more permanent than chrome or any other of the greens, and is also less affected by sulphur and gas.

Fireproofing Shingles.—Anything that will hinder the action of a firebrand on a wooden roof will be more or less a fireproofing substance. Ordinary oil paint is such. A dry old shingle is like tinder, and a mere

spark is sufficient to start a blaze. But when coated with paint the spark may die without doing any damage. Use a good mineral paint, such as iron oxide, or Venetian red, or any mineral paint.

Repainting Yellowed White Paint.—When a room has been painted white and has become yellow through age or improper mixing, do not repaint with white over it before giving it a coat of white shellac. If you paint white over the old paint the latter will come through and spoil your white. Even shellac does not always prove sufficient to keep the old paint from showing through, though it is the best thing we know of for the purpose.

Painting Over Creosote Stain.—The creosote will stain through any paint, but a coat of shellac may hold it back when oil paint is applied over the shellac. It is not sure, however. Let the shellac become dry before applying the oil paint.

Paint for Blackboard.—For a green slating paint mix together equal parts of Prussian blue and medium orange chrome yellow; thin it to the consistency of thin cream with equal parts of gold size and alcohol; apply this with a wide stiff bristle brush. Let it dry twenty-four hours, then rub smooth with felt, after which give it another coat of the paint. You can vary the proportions of the two pigments to get different shades of green slate.

The blackboard must be made perfectly level and smooth before applying the paint.

Another formula: Take 4 pounds of lampblack in

oil, 1 pound of ultramarine blue in oil, and 1 pound of fine powdered pumicestone. Mix together and thin with turpentine, and add a little japan to dry it.

Colors to Mix with Lime or Mortar.—These are yellow ochre, Venetian red, iron oxide, Indian red, raw umber, burnt umber, raw and burnt sienna, ultramarine blue, and lampblack or carbon black. There is also a lime-green, listed with a line of lime-proof mortar colors made by certain makers.

Mixing the First or Primer Coat.—For the first coat of paint on wood use very little white lead or coloring, the oil being the important thing. The wood should be saturated with oil, with none left free on the surface. Anywhere from 5 to 7 gallons of oil to 100 pounds of lead may be used. The former quantity, however, is rather too little. Some painters add turpentine to make the oil go deeper, but it is usually not necessary. Much will depend upon the weather, time of year, and condition of the wood. In cold and damp weather a little turpentine is useful, with a small increase in the amount of drier used. In summer use little drier in the priming coat, as it tends to retard the oil from entering deep into the wood, because it partly dries the oil too soon. Fresh mixed paint is best for the priming coat, and do not use boiled oil; fresh raw oil is preferred.

Mixing a Pot of Paint.—To make a pot of paint for inside use, after the primer coat has been applied and is dry, take 8 pounds of white lead in oil and thin it out with turpentine; for white work pale

japan drier is best, as it will not stain the paint as dark japan will to a small extent. The coat on top of the priming coat may have a very little oil in addition to turpentine, but the finishing coat should have no oil at all, there being plenty in the lead as it comes from the keg. In fact, to get a perfectly flat or lusterless finish in white it is necessary to remove the oil from the lead by washing it out with gasoline, benzine, or turpentine.

How to Paint Hemlock.—Different woods require their separate treatment, and hemlock is one of the worst to paint. The first or priming coat of paint should be applied liberally and be well rubbed into the wood; use very little driers, so that the oil will not be hindered from entering the pores of the wood. Allow the paint plenty of time for drying. The second coat should be rather thin, and for this reason it is best to give the work four coats instead of the customary three, used on most other woods.

Kerosene oil, commonly known as coal oil, is not good to mix with paint, as it is a non-drying or greasy oil, does not adhere to wood, with paint, nor does it mix well with other fluids in paint under ordinary circumstances. It retards and even prevents the drying of linseed oil paints. It does not mix at all with turpentine any more than it does with water. Paint containing kerosene oil will not adhere to paint very long, and oil paint applied over it will ultimately peel off. It is false economy to use such oil in paint, inside or outside.

Repairing a Cracked Wall.—Before painting or papering or calcimining walls the cracks should be filled and any broken places be mended. The sounder and smoother the surface, the better the appearance of the finished job. Plaster of Paris with thin glue size make a good stopping, but may in some cases crack some in drying. Plaster of Paris mixed with water and a little vinegar, to keep the plaster from setting too soon, is best. Large cracks must be cut out or keyed, the inner part wider than the outer, for in this shape the filling will be held in more securely than in a straight-cut opening. Wet the edges of the plaster first before filling with the plaster-of-Paris mixture. As plaster shrinks some in drying it is better not to fill a large or deep cut to the level, but only about half-full, and when nearly dry fill up the balance of the cut. When dry, sandpaper all filled places smoothly. A thin coat of shellac is best if the finish is to be paint. For old painted walls that are to be repainted the cracks should be filled with a putty made from white lead and whiting, mixed with hard drying varnish and a little japan drier. Sometimes a wall or, more commonly, a ceiling will be broken, and one side of the break will be higher than the other, in which case mix white lead with japan to form a stiff paste, and apply it with a broad glazing knife. Fill the low side to the level of the higher side, and, when dry, sandpaper smooth.

Quantity of Driers to Use.—The question, How much drier should be used with a pot of oil or tur-

pentine paint? is very often asked by the inexperienced. The expert painter guesses at it. Long experience has taught him how to gauge the amount, he taking into consideration the character of the work the paint is for, and of the paint itself. Almost invariably, however, the expert uses entirely too much, the result of which is that in the case of the oil paint the drier burns the oil and so injures the paint, or in turpentine-mixed paint, where the color is almost always white, the color is darkened. Then something depends upon the strength of the japan drier, for this varies greatly with different brands. Hence it is impossible to do more in the way of advice than to indicate the amount in a general manner. The best grade of turpentine japan drier should be used, and of this about a tablespoonful to 10 pounds, or common paint pot full, should be enough under average circumstances.

Pigments differ in self-drying qualities; burnt umber and chrome yellow are good self-drying pigments; lampblack, drop black, and Vandyke brown are poor driers or, rather, do not dry unless assisted by japan or the oil in which they may be ground, for raw linseed oil is a good self-drier, as also is white lead. The earth colors, such as sienna, ochre, etc., need assistance to dry.

A Practical Painting Pointer.—A four-square building that stands exposed to the weather on all its sides presents a problem in painting that few even of the experts have considered, and the present writer

is probably the first to suggest it as being worthy of consideration. When painting such a building the painter uses the same paint on all four sides, forgetting that these sides receive different weather wear, and that each should be so considered. To explain: The north side receives very little sun direct, this little coming from the northeast and the northwest in the long summer days (I speak now of the latitude embracing the middle Atlantic region). The north side, therefore, gets very little of the sun's destructive action, if any at all. On the south side the condition is quite the contrary. There the paint receives the hot blast from early morn until late afternoon, and this intense heat is very hard on the stability of oil paint. There may be something in the sun's rays other than mere heat that acts injuriously on the paint. On the west side the matter is nearly as bad. There the sun of the afternoon, when it is shining, has full sway. On the east there is not so much sun except in the long days, but the east storms of winter, the snow, sleet, and hail, all combine to attack and injure that painting. So that it is evident that the one kind or mixing of paint is not adapted for the four sides alike, no more than ready-mixed paint is adapted for all sorts of painting. However, if you will get plenty of oil in the paint that will be the best guarantee against wear and tear of the paint on whatever side it may go.

Raw or Boiled Oil for Outside?—This is another of

the paint questions often asked and discussed. Each oil has its advantages; boiled oil is something of a varnish, and makes a tough, elastic paint, that wears well under most conditions. It dries in paint quicker than raw oil, and dries on the surface first, so that the paint mixed with it dries free from dust and cold sooner than the raw oil, but raw oil is most generally used for ordinary paint.

To Whiten White Inside Paint.—As the laundress drops in a little soluble Prussian blue in her rinse water to whiten the clothes, so, too, the painter at times adds a little ultramarine blue to his white paint to take off its yellow cast. There are two ultramarines that give different tints with white—one a rather greenish cast, the other a violet hue; choose the latter. True lampblack would be better than ultramarine blue, but carbon black is not desirable. It is the oil in white lead that imparts the yellow cast to white paint.

To Bleach Dark Spots in Wood.—Knots and other dark parts in natural wood may be lightened in color by bleaching; the bleaching fluid may be made as follows: Dissolve $17\frac{1}{2}$ ounces of chloride of lime and 2 ounces of soda crystals in $10\frac{1}{2}$ pints of water. After the bleach has been applied and has dried apply a solution of sulphurous (not sulphuric) acid. Yellow pine-knots cannot be bleached.

Making Old Paint Skins Into Good Paint.—Dregs of paint from straining paint and from settlings in paint pots, or from whatever source, including old

dry lead and paint and putty, may be made over again by adding some linseed oil to the mass and boiling until soft; take from the fire and add a little benzol, which will cut the old stuff that has not yielded quite to the heat, then thin the mass with benzine just enough to enable the stuff to pass through a strainer. A sieve of very fine mesh is best. Then allow the paint to become cold, when it will be much thicker than before; then it may be thinned out with raw linseed oil.

Painting Over Burlap.—When the burlap wall covering has become faded and ill-looking it may be made to look well with paint. First make fast any loose parts, and dust off clean. Then give it a coat of thinned cheap varnish as a size, and when this is dry you may apply any sort of paint you prefer. It may dry either dead or with gloss. One good way is to glaze the last coat of paint and scumble it. Say the last coat is a yellowish tint; scumble with raw umber, or raw sienna, according to the degree of coloring you prefer. UMBER we think the best. The raw umber is made very thin with oil, and rubbed out in spots to produce a mottled effect, which we call scumbling.

Mildewed Burlap.—First make clean by dusting off with a stiff brush. Then apply this size: Dissolve 4 ounces of alum in 1 gallon of hot water; 4 ounces of bluestone in 1 pint of water; 2 ounces of best white glue in 2 quarts of hot water, and 2 ounces of sugar of lead in 1 quart of water. Mix separately and while

hot; add the bluestone solution last. Allow the size to dry.

Painting Window-blinds.—Directions have been given in another part of this work for painting window-blinds; the following are supplementary remarks: Don't hold the blind by the edge when painting inside of the rail, for that causes the paint to run into the pin-holes of the slats, which when dry causes the slats to work hard. When done painting the blind set it with its top part down, on strips of board, so that the edge, which will show from the top when hung, will not get soiled. Also, by setting the blind upside down, any dirt that may chance to get on the edge will not show from the ground. Also, by setting the blind upside down any paint that may run will not go to the bottom part or edge and form drops there, and which when dry and hard will make it more difficult to close the blind by their catching on the window-sill. Be sure to open the slats when you are done, so that they will not stick fast. Have a small stick for opening and closing the slats when you are painting, so that your fingers will not get the paint. Have a rag handy for wiping off your hands, and don't wipe on the sides of your overalls.

How to Clean Enameled Paint.—Dust off and remove all soil and dirt. Have a damp cloth and some precipitated chalk, and with these give the work a gentle rubbing. Soft flannel is best, and the best grade of whiting will answer instead of the chalk, being much cheaper, but with more grit. Dip the

flannel in hot water and wring out dry as possible and dip in the whiting or chalk. Follow with washing with clear warm water, then rub dry with a soft chamois or rag.

To Clean Slate Blackboard.—To remove grease, dirt, etc., use paint remover, benzol, or alcohol; or strong ammonia water may do.

Cleaning "Painty" Clothes.—Overalls or other garments soiled with paint may be made clean by soaking in water containing sal soda, say $\frac{1}{2}$ to 1 pound to the bucket of water. Let soak over night, or until the old paint has become softened. Then lay the garment out on a board and scrub with warm water and soap, using a scrub-brush. Any thick spots may be scraped with the putty knife. Then rinse out in clear water and hang out to dry. The soda does not rot the goods, and it does remove all the paint but the mere stain. Dark spots may be removed with chloride of lime.

Painting on Hard Pine.—Oil paint does not adhere well to hard pine, but if you will add a little pine tar to the priming coat it will cause the paint to stick. Mix white lead, without color, in 1 part pine tar, boiled oil 3 parts, and when applied and dry apply two coats more of paint, and you will have a good job.

To Clean the Paint Pot.—Fill it with paper or shavings and pour on a little coal oil, then set fire to it; very soon commence to scrape away the old paint from the inside with a putty knife, scraping downward, and then do the outside. The fire soon

softens the old paint, making it easy to remove, and after having scraped all pretty much away, turn out the burning mass and finish scraping inside and out. After this sandpaper the outside smooth, and also clean up the inside. It requires but a few minutes to clean the dirtiest pot. A thin coat of paint on the outside will make the pot look neater.

Cheap Paint for Old, Rough Woodwork.—If you have an old building to paint, barn or house, the weather-boarding free of paint, give it a first coat of water paint made with thin glue size and whiting. This will fill up the wood and give a hard surface for a coat or two of oil paint. Use very thin glue size and not much whiting in it. Apply it hot with a whitewash brush.

Fireproof Paint.—Mix the following liquid, and add to it any pigment you wish. To 1 gallon of a mixture of equal parts of lime-water and vinegar add 8 ounces of table salt and 4 ounces of sulphate of zinc, each powdered. Boil the mixture, then add 1 gallon of boiled linseed oil, then boil again. Take from the fire and stir in 1 gallon of crude petroleum oil, heat again, carefully, on account of the nature of the liquid, bring it to the boiling-point, and it is done.

This will be found serviceable for fireproofing shingles, etc.

To Make a Milk Paint.—Into 1 gallon of whole milk stir about 3 pounds of Portland cement and color to suit as you wish. Sour, skimmed, or buttermilk also will answer, but whole milk is best. Keep the

paint stirred while using it, as the cement settles. This paint is said to give good wear and hold its color. Useful on barns, fences, and all common work, though it has also been used satisfactorily on houses.

Painting Canvas for Roof or Floor.—Canvas of 8-ounce weight is mostly used. Stretch it tight and tack with galvanized tacks. After painting the under side and allowing it to dry, wet the other side with water and apply paint while it is damp. This method of painting canvas makes it waterproof.

Painting Over Sanded Work.—If the old sanded work is in good condition it needs only to be made clean of dust and then be painted over with ordinary oil paint, any color desired. Dash on sand while the paint is fresh. A middling heavy coat of paint is necessary in order to take and hold the sand. If the old sanded paint is in bad condition, it will be necessary to remove it by burning off or with strong lye-water. By softening it with benzol or paint remover it may be scraped off.

When is the Best Time to Paint Outside?—The months of September, October, and forepart of November are the best times. A temperature between 55° and 75° is the best. A dry atmosphere is desirable. Thus it will be found that autumn offers the most satisfactory period of the year for exterior painting. In spring there are sudden showers and some frosts. In summer it is too hot and there are dust and flies. Winter has hard frosts, which affect fresh paint, while it is very uncomfortable to work

then. The paint, too, will thicken, making it difficult to spread, and it does not brush out to as light a coating as desirable. Such paint should not be thinned out with oil or turpentine, but should be warmed in the house. Tin roofs should never be painted in hot or cold weather.

Paint for Wire Screens.—Take drop black, ground in oil, and mix with it about one-third as much of asphaltum varnish, thin it with turpentine; add a little drying japan; strain the whole.

Paint for Bridges, Etc.—The paint used on the elevated roads of New York City was made as follows: Finely ground oxide of iron $7\frac{1}{2}$ parts, boiled linseed oil 9 parts, and turpentine 1 part. Mix well together. Some black may be added if the red color is not desired. Use lampblack, which will make the paint more elastic and better. This paint is useful on all structural ironwork, but not for metal roofs.

Varnish in Exterior Paint.—Some painters add a little spar varnish to outside paint to toughen the paint and give it more gloss, but the practice is not to be commended; the paint is more liable to crack unless very little varnish is used.

Painting in Frosty Weather.—A little turpentine added to the oil paint for use outside in frosty weather tends to prevent wrinkling of the paint, and also makes the paint easier to spread. Don't use too much, for it will injure the gloss of the paint.

When is the Paint Dry?—One coat of paint should be dry before the next coat is applied, so how can

we determine just when this dry state occurs? Of course, if we wait several days it will surely be dry, but suppose we wish to push the work, and get the coats on as rapidly as may be consistent with durable work. In a general way we may say that twenty-four hours between coats will do, but sometimes more than this will be necessary, it depending on certain conditions. One painter says he allows ten days, but this is unnecessarily long. In general, twenty-four hours will do. At any rate, if average paint, under average conditions, does not dry perfectly within forty-eight hours, there is something radically wrong either with the paint or the surface painted. Coats of paint adhere together better when not too long a lapse of time intervenes between their application.

How to Use Paint Remover.—Liquid paint remover is made from certain fluids that readily dissolve oil and certain gums, so that when applied to paint, which usually consists of oil and pigment, it gradually softens it, so that it may easily be removed by scraping with a scraping knife. Some removers consist of two or more different but equally effective liquids, in combination, by which they prove even more effective than when used singly. The mistake many make in using this remover is in trying to force the work, that is to say, by beginning to scrape too soon. Give the remover time to eat clear through the old paint before beginning to scrape. You will make easier and faster headway. Brush the remover on in one direction only, and not criss-cross or anyhow.

And don't brush the remover after you have applied it, for this destroys some of its solvent power. Let it alone for a little while, then try a little edge of it with the scraper, and see whether it has eaten down to the surface of the wood. When the old paint is not very hard the remover will soften it in a few minutes, but if it is hard it may require hours. The thin liquid remover quickly evaporates, and is best for inside use. The heavier remover remains moist quite a while, and is intended for exterior use.

A strong alkali remover may be made from fresh slaked lime and concentrated lye, mixed with water to form a paste. Or sal soda may be used in place of the lye, making a less powerful caustic. Take equal parts of sal soda and fresh lime and dissolve the soda in water, then add the lime to it. Concentrated lye and caustic soda are identical caustics. The latter is cheaper than potash. A box of concentrated lye to 2 quarts of water makes a strong paint remover.

Paint and varnish may be removed by the gasoline torch, and it is about the best way, too, only there is danger from fire sometimes.

PRACTICAL NOTES FOR THE HOUSEWIFE

THE careful always save a piece of the wall-paper that has just been applied to the wall, and when the paper becomes old and faded on the walls and you wish to patch a part of it, take some of the paper you saved and place it in the sunshine until it fades down to the shade of the paper on the wall where you wish to patch, and the patch will hardly be seen.

To clean a painted wall dissolve 2 ounces of powdered borax in 2 quarts of water, and to it add a tablespoonful of ammonia-water. Have two buckets, and into each pour one-half of the liquid, then fill the vessels with water; don't use soap. Do a small place at a time, and rub it dry with a cloth.

Fresh paint on clothing may be removed by rubbing the soiled part against a clean part of the dress or clothing. If the paint is too much for this sort of treatment, then use turpentine or benzole.

When the doors are to be painted it is best to remove all fixtures, such as escutcheon, lock, etc., and if they are soiled with old paint, soak in some strong sal soda water until the paint is soft. Or benzole or varnish remover will do, if you have it.

Another way to avoid painting the fixtures on a door is to cut out a piece of cardboard about 4 inches square, cut a hole in the center the shape of the plate,

and after the paint is dry it may be removed from the fixtures, and if any brass it may be polished without damage to the paint.

Lemon juice will remove marks made on paint by striking matches on it. But after applying the lemon juice the part must be rubbed with a damp rag dipped in whiting; finish with clear warm water and a good white or Castile soap. Soap may be used on paint if not too strong or rubbed too much.

To remove ink stain from mahogany dissolve 1 ounce of oxalic acid in $\frac{1}{2}$ pint of soft water; the addition of $\frac{1}{2}$ ounce of butter of antimony will increase the effectiveness of the formula. This will remove almost any kind of stain from wood.

A good renovator and polish for highly polished surfaces, such as auto bodies, etc., may be made by boiling some sweet oil (olive oil) and adding to it a little strong vinegar. Apply it moderately and rub it with a soft flannel to a polish.

Burn juniper berries in a freshly painted room to overcome the odor of paint. Also for removing the viler odor of freshly applied wall-paper of some kinds. Keep the room closed twelve hours, then air it thoroughly, and the room will be free of the odors.

To make an easily prepared blackboard slating take water-glass and darken it with dry lampblack.

Polished furniture that has become dingy from the effects of gas, etc., may be revived by going over it with a rag dampened with a little benzine. Then let it stand an hour or so, and wash it off with sudsy

water made from Castile soap, using soft cloth. When dry polish it with a dry soft cloth.

If you wish to paper walls that are covered with old lime, saturate it with strong lye-water, 8 ounces of concentrated lye in a bucket of water. This will rot the lime, after which it may be scraped off. Be careful with the lye-water, as it is very caustic and burns the flesh if in contact with it.

When washing painted work take some old pieces of sponge, if you have them, and place in a bag of Turkish toweling or piece of burlap.

Usually when renovating the furniture the finish will look greasy. This may be removed with vinegar, or prevented by adding strong vinegar or acetic acid to the furniture polish. Acid is an excellent cleanser. When linseed or sweet oil is used in a furniture polish it is apt to give the finish a greasy look, and when such renovator is used it should be well rubbed off with a clean dry cloth.

For finger-marks on a white painted door there is no cleanser better than whiting and water, rubbing with a clean cloth. Wet the rag or cloth and dip it into the whiting. It is safer to use than soap.

Where it is desired to paint an invalid's room the usual oil and lead paint will not do. Use a milk paint. Take 2 quarts of skimmed milk, 6 ounces of hydrated lime, 4 ounces of raw linseed oil, and 3 pounds of Gilder's Bolted Whiting. Put the lime in a clean earthen vessel or enamel bucket and add to it enough skimmed milk to make it like thick cream;

then stir in the oil a little at a time. Use a wooden paddle. Then stir in the remainder of the milk, after which add the whiting. Such a paint will dry in about one hour. The lime and oil combine to form a soap, and the oil loses its peculiar odor thereby. Any color may be used, and one coat is usually sufficient. The formula given is for the woodwork, and will cover about 25 square yards of surface.

A good white paint for stove or radiator may be made with dry zinc white paint mixed with water-glass.

It is difficult to paint cold-water pipes owing to their usually being damp. The water will have to be run out first, then apply a coat of thin copal varnish or shellac, over which apply bronze powder or oil paint, as you may choose.

To paint a metal bath-tub, first wash it clean with strong soda water, then with soap and scrub-brush, then rinse, and let dry. Then sandpaper it well, and if necessary remove any old paint by scraping or by liquid remover. When clean and dry, apply a coat of white lead paint, with no oil; thin with turpentine and add about the same quantity of gold size japan. Apply at least three coats at intervals between each coat of twenty-four hours. Lightly sandpaper each coat with fine sandpaper. Finish with a coat of bath-tub enamel paint.

Don't use the tub for several days after the finish. A coat of enamel paint once a year will keep the tub in good condition. Twice a year will be better.

If your furniture or house trim has been coated with sticky varnish, mix and apply a coat of equal parts of turpentine and japan drier, and apply this to the sticky varnish with a stiff bristle brush. Or coat the sticky varnish with shellac varnish.

Porch floors will last longer if, when laid, they are coated with hot tar on the under sides and edges. This will prevent dampness from getting into the wood.

To remove tobacco stains from a new floor add 8 parts of hydrated lime to 1 part of calcined soda or potash, and let it stand one hour. Then add 15 parts of water and bring all to a boil on the stove. This is applied to the stain and left to dry on it. Then rub it with a scrub-brush and fine sand and water.

To remove mold from wall-paper, the cause due to dampness, dissolve 1 part of salicylic acid in 4 parts of strong alcohol; apply with a soft sponge.

To soften hard putty put it in a small vessel and cover it with hot water; set it back on the stove for a short time, when the heat will have softened it; then knead it with the hands. Dry white lead may be softened thus, and then be mixed with oil.

To make a polishing cloth use pure woolen cloth, dyed aniline red. Soak the cloth in the following mixture: White Castile soap 4 ounces, jewelers' rouge 2 ounces, water 20 ounces. One ounce of this will do a cloth 1 foot square, but several cloths may be done at one time. Chamois skin, so-called, is better than woolen cloth.

To make old writing legible for copying dissolve 150 parts of oxalate of ammonium, 0.8 part of ferrocyanide of potassium, 0.6 part of vanadate of ammonia, all in 1000 parts of water, and when copying use this solution to moisten the faded places.

Never heat a new stove too quickly, and don't let the top of the stove become red hot. Don't pile coal above the fire-box. Don't rush the range with the oven draft open; it burns out the range and wastes the fuel.

To make a waterproof paste mix together dry litharge 3 parts, dry white lead 3 parts, plaster of Paris 3 parts, and powdered rosin 1 part, all by weight. Make into a paste with boiled linseed oil and use at once.

To temporarily repair a clothes-wringer that has its rubber rolls worn down in the center, wrap it with strips of unbleached muslin several times around, lapping each half-way, and making all fast with needle and thread.

When building a chimney it is better to put the hardest bricks on the inside, where they are subject to the disintegrating gases from the fire or smoke. In fact, it would pay to have hard-burned bricks on inside and out; for they would stand the wear and tear better. Soft bricks are mostly used on inside.

To remove grease from stone steps pour boiling hot sal soda water over it, then apply a coating of fuller's earth over it, the latter made into a paste with hot water and left on the grease over night. It

may be necessary to repeat the operation. Follow by rubbing with fine sand and a smooth bit of stone, with hot sal soda water.

For removing fly specks from gilded frames old ale used to be recommended, but as there is neither young nor old ale now, the next best thing is either lemon juice, after washing with soap and water, or rubbing with water slightly acidulated with muriatic acid.

If iron gates become rusty, coat them over with graphite and water, such as you see on the stove, and this will absorb the rust, after which the whole may be dusted off and the gate painted.

To make an acidproof ink, one that will resist both chlorine and oxalic acid, and flow easily, rub down genuine India ink with a good black writing ink to the proper fluidity.

To cause paper to stick to metal use a strong solution of sal soda; heat the solution, and while it is hot dip the metal in, and when it is clean take it out and rub it with a soft cloth. Apply onion juice to the metal and press the paper smoothly over it; it will stick tenaciously.

When water has spilled on a page of a valued book lay a blotter on each side of the leaf and iron dry with a medium hot iron.

To renovate banjo vellum lightly dip a soft sponge in benzine and rub the dirty parts with it, which will remove the stain without injuring the head.

To renovate gilded picture frames rub with the cut half of an onion, which will remove the grime.

Or squeeze onion in a lemon squeezer to extract the juice, to which add a very little water, for if the juice is too strong it may remove the gilding. Rinse well with clear tepid water and let the frame dry. Then polish the gilding with a soft rag.

To make a cement wash for damp walls use 1 part of lime-water with 7 parts of soft water and a little salt. Stir in the cement until of the consistency of paint. This may be colored with any limeproof pigments.

When there is a squeak in the floor whenever it is walked upon it indicates that two ends of the boards are loose, and do not rest on a joist. A good cure is made by inserting a screw in the cut separating the two boards.

To make rubber cement for putting patches on rubbers dissolve some old rubber in bisulphide of carbon. Apply this to the patch and to the edges of the hole, apply a heated iron, and press it down, the heat securing the patch to the rubber. First scrape and clean the old rubber around hole.

To remove rust from polished steel objects cover the rust with sweet oil and let it remain on for a day or so. Then rub the part with a lump of fresh lime, after which polish the place.

A good way to use sawdust on an icy pavement is to soak the sawdust in hot water and put it on the ice while still hot. This will cause it to bite into the ice a little and so afford a better footing. Dry sawdust is likely to cause one's feet to slide.

Moths dislike being disturbed, hence one of the best means for preventing their destructive work with furniture and floor coverings, not forgetting woolen clothes, is to shake and beat them now and then. Rugs are the easiest to handle, and should be taken out and shaken of dust, etc., often. It is the fly that lays the egg that produces the larvæ that are at the head of the invaders. Shake out and you get them all, especially the eggs. Mix some turpentine with water and sprinkle it around the edges and along the seams of carpets, but shaking is the most effective means for combating moths.

To clean window-shades take them down and dust off dust and smoke. Then with a soft cloth, which must be clean, wipe off gently. Don't wash off with soap and water, for that will injure paint, even lead paint, and, of course, cheap shades are painted with water color. Lay the shade cloth down on an even table—the large piano top is fine—and wipe carefully with soft rag, and you will restore the color and make it look like new. Soap and water may be necessary in some cases, but never will do on water-painted surface.

To make corks acid and alkaliproof prepare a solution of 20 parts by weight of gelatin, and add 1 part by weight of glycerine. Heat the solution to 112° F., or to about the temperature of a baking oven. Place the corks in the solution and let them soak for about thirty minutes; then remove them and wash in lukewarm water, after which allow them to dry.

Now mix 2 parts by weight of vaseline and 7 parts by weight of paraffin, and bring to a temperature of 100° F., and steep the corks therein, leaving them there for about ten or fifteen minutes. This will make corks proof against anything but solvents of paraffin and glycerine, such as ether, alcohol, benzine, fusel oil, benzol, etc.

When lighting a gas jet provided with a gas mantle delay a moment after turning on the gas before applying the match. If match is applied before this there is danger of the mantle breaking.

Upon a pinch a bit of cold boiled potato may be used as a mucilage. Rub the potato up and down on a piece of paper and see how sticky it feels.

A paste that will stick to bright tin may be made from rye flour paste, using strong soda-water to make the flour into a stiff batter. Add a little Venice turpentine or Canada balsam. This paste will not sour even in August weather.

To make a wheat flour paste that will not turn rancid or alter in any manner during the entire summer, make into stiff batter with water as warm as possible, then stir in boiling water to form a thick mass, after which set on stove and bring to a boil, then remove and drop in a little formaldehyde, stirring the paste well together.

When mixing plaster of Paris don't pour the water into it, but sprinkle the plaster into the water. Take about as much water as of plaster. When the mass is about like cream it is right. To keep it from setting

too soon add a little vinegar, not much, or it will kill the plaster so it will not harden. Thin glue size may be used for the same purpose, though powdered marshmallow is better. To cause the plaster to dry extra hard add a little powdered alum or sulphate of potash.

When ceiling or walls are dirty from coal smoke, the paint beneath being good, apply a coat of starch mixed with cold water. When dry it may be rubbed off, when the starch and grime will come off together, leaving the paint clean.

When the silver has come off the mirror in spots it may be repaired by melting together equal parts by weight of lead, tin, and bismuth; before the mass cools add 10 parts, by weight, of mercury. Lay the glass on a level surface and pour the liquid over the worn spots; then drain off the surplus. When dry, apply a thin coat of red lead paint.

To restore a polished table top that has been marred by a hot dish, producing a white spot, an expert says he never found anything as good as rubbing it with a piece of butter placed in a folded rag, rubbing the spot briskly with this. A few minutes of hard and quick rubbing will remove the white appearance effectually. Another way is to hold a moderately heated flat iron over the spot, and when the varnish has been made warm polish it with a rag wet with a little raw linseed oil.

A good polish for brass work may be made from equal parts of water and ox-gall, boiled together.

When cool, place it in a bottle, well corked, for future use. Some say that buttermilk with a little salt in it makes a good brass polish. If so, it probably depends upon the acid in the milk.

It is sometimes desirable to write on bright tin, and thin asphaltum varnish, using a pen, is the best way. Thin the varnish with turpentine, and keep it in a corked bottle. Shake when needed for use. If it is desired to remove such writing from the tin, take coal oil and a rag and rub off.

If a few drops of turpentine be placed on a dry duster when cleaning the window glass it will dry quickly and the glass look bright; follow by polishing with a dry duster. Especially good in damp weather.

A good silver polish may be made by mixing together $\frac{1}{2}$ ounce of table salt, $\frac{1}{2}$ ounce of alum, and $\frac{1}{2}$ ounce of cream of tartar. Place in a large white-ware vessel and add 2 quarts of water; stir frequently until dissolved. Shake the mass well before using. Pour some of it into a bowl and wash the object all over with it, using an old soft linen rag. Let the object stand a few minutes, say ten, then rub dry with buckskin.

Glasses used for milk, or any milky foods, should always be washed in cold water, as hot water leaves a cloudy appearance and makes a good deal more work in the washing. The same rule applies to new glasses which have never been used.

For marking corrections in blue prints strong sal

soda water and a new steel pen may be used. This will make very clear, white markings.

A good stove polish may be made from 1 pound of graphite, 1 ounce of sugar, 4 ounces of water, and the same of turpentine. Graphite and water alone make a good polish, but the sugar is used to make the polish more durable.

To make an excellent blue-black writing ink take 6 ounces of Prussian blue and 1 ounce of oxalic acid, and mix with a little water to a smooth paste, after which thin down to the right consistency with soft water.

To waterproof a canvas tent and paint it so that it will not be stiff, mix with the desired paint 1 ounce of yellow soap melted in $\frac{1}{2}$ pint of hot water; this will do for 7 pounds of paint. Apply this as stiff as you can lay it on with a brush. Let it dry two days, then lay on a coat of the same paint, but without the soap in it. When this coat is dry you may paint the cloth any desired color. After three days of drying the cloth may be rolled up without danger of sticking together; of course, it is also waterproof. A portable canoe may be made from this cloth.

To waterproof canvas cloth, dissolve soft soap in hot water and add a solution of iron sulphate (green vitriol), which combines with the potash of the soap, the iron oxide precipitating with the fatty acid as an insoluble iron soap. This precipitate is then washed and dried and mixed with linseed oil and applied to the canvas. This not only makes the cloth

impervious to water, but the cloth is flexible and not inclined to crack.

A simple and excellent harness black may be made from polishing wax, which is simply beeswax or similar wax dissolved in turpentine, and some dry lamp- or drop black. Rub for the polish.

To make liquid dextrine or mucilage, to 10 parts of dextrine add 30 parts of water and 5 parts of alcohol. Mix well together and bottle for use.

Ink for rubber stamp may be made from $\frac{1}{8}$ ounce of aniline blue, or black, in 1 fluidounce of 95 per cent. alcohol, and 1 fluidounce of refined glycerine. Aniline colors soluble in alcohol must be used for these inks. For black use nigrosene B., for red take fuchsine, eosine, or ponceau, for blue take night blue, for violet take methyl violet, for brown use acid brown, and for green use brilliant green.

If the ink becomes too thick, thin with alcohol and glycerine. If too intense, add more glycerine.

These inks do also for typewriter ribbons.

The chamois skin is apt to be wash leather, the hide of a young goat. Never leave the skin in water after using. Wring it out dry, spread it out carefully, then hang it up to dry. Hot water will make it harsh. To keep it soft wash out with water and white soap, and leave some of the soap in the skin when wrung out to dry. When taken care of an old skin is better than a new, for it has none of the lint that a new one has.

To clean stained polished marble, take equal parts

by weight of fresh ox-gall, pulverized soap, and a little turpentine. Add also a little pipe clay. Plaster this on to the stained part and let it remain until perfectly dry. Then remove and wash the part with soft warm water. It is sometimes necessary to repeat the operation.

To determine which is the most economical soap to use, weigh a cake and cut it up, place it in a vessel on the fire, and add a handful of salt. When the soap has dissolved, set it away to cool. The soap will separate from the water and may be taken up and weighed. Any loss in weight as compared with its original weight will indicate the amount of adulteration that was present.

Sealing wax for canning may easily be made at home, and you will also get a superior article. Take brown rosin 6 pounds, gum shellac 2 pounds. Melt and add 2 pounds of Venice turpentine, then mix in dry Venetian red to color. Without shellac a good sealing wax is impossible, and the store wax has no shellac in it. A wax for sealing bottles may be made by melting together 6 pounds of rosin and 3 pounds of paraffine wax, and adding Venetian red for color. This wax does not need any shellac.

To remove stains from silver and gold immerse for some time in a solution of $\frac{1}{2}$ ounce of cyanide of potassium to 1 pint of soft water, after which brush off with prepared chalk.

At certain times of the year the walls of a brick or stone house may become damp, at which times

do not open the windows to let in the warm air, as this will condense on the walls, wetting the paper or other finish. A fire would do better. To prevent dampness from the outside the inner walls should be treated as follows: First take a dry time for doing it. Clean the walls, then make up two solutions, as follows: Cut up 12 ounces of Castile soap in 1 gallon of water, and dissolve. In another vessel dissolve 8 ounces of pulverized alum in 4 gallons of water. Reduce or increase proportions according to size of room. Use a wide bristle brush for each solution, a brush for each. Apply the soap solution first, rubbing it well into the wall, and after twenty-four hours apply a coating of the alum solution, which goes on with difficulty owing to the glazed nature of the soap. Rub it well. Let stand twenty-four hours, then repeat the soap solution, let stand as before, then finally apply a coat of alum water. It is done. No dampness can come through this sebate, and paint or paper may be used over it.

A good dressing for linoleum: Make the linoleum perfectly clean with soap and water, let it dry, then rub in the dressing. Mix equal parts of paraffine and palm oil, thinning to a proper consistency with kerosene, say about 4 parts. A wax dressing: An ounce of beeswax, 2 ounces of Carnauba wax, melt together, take from stove, and add 10 ounces of benzine, 10 ounces of turpentine, and stir the mass together until cool. Rub in with a cloth to a polish.

To make leather vermin-proof mix castor oil with beef tallow and rub it in well.

To remove iron stain from marble top stand cut a lemon in half, dip one cut piece in salt and rub the stain. Should this fail, try ammonia, which often succeeds when all else fails. Rinse with clear water and polish with a soft cloth.

The food preservative power of certain substances at ordinary temperature, the food in all cases being assumed to be at least slightly acid, is given as follows: 1 pound of salt preserves 6 pounds of food material; 1 pound of benzoate of soda, 500 pounds; 1 pound of alum, 200 pounds; 1 pound of acetic acid, 40 pounds; 1 pound of sugar, 1 pound; 1 pound of glycerol, 4 pounds; 1 pound of alcohol, 8 pounds.

To take away the odor of glue when heating it add a little saltpeter to it. This will also make the glue dry faster and become harder.

For a household fire extinguisher nothing is better than aqua ammonia, particularly if used at the start of a fire. The next best thing is carbonic acid gas, but the ammonia is cheap and easily obtained.

To mend tinware fill a bottle two-thirds full with muriatic acid and add zinc chips until the acid will dissolve no more, then drop in a crumb of sal ammoniac, then fill the bottle with water. Wet the part that is to be repaired with this liquid, place a piece of sheet-zinc over the hole, and place a candle below it, which will melt the solder on the tin and cause the zinc to adhere.

To polish aluminum ware, make a mixture of borax, ammonia, and water, and apply with a cloth: 20 grains of borax and a third as much ammonia as water. Keep corked and shake for use. When much blackened, place in oven of moderate heat for two hours, which will brighten the ware.

To repair broken marble use sealing wax; heat both the wax and the broken marble part, apply the wax, and press hard together. Make the wax as near the color of the marble as possible, and when dry rub the mended part with a hone, and then polish with oxalic acid.

To remove lime deposit from bottle or glass pitcher fill with strong cider vinegar and let it stand until the lime is loosened. Any acid will disintegrate the lime.

The darkened lights of old oil paintings may be restored by touching them with peroxide of hydrogen diluted with from six to eight times its weight of water; after which wash with water and a clean sponge.

As a light muslin curtain is liable to catch fire, it should be made fireproof by adding a little alum to the rinse water. While this will not make the muslin absolutely proof against fire, yet it will retard the flame and make it weaker.

If you do your own cobbler work, don't wait until the sole is well gone, but put on a new one just before that. Dip the new soles a minute in water, then wrap in paper for two hours. This makes the leather

pliable, but not wet. Drive in a nail at toe and near middle, then hammer down all around to make the sole fit the shoe. Then drive in the tacks around edge of sole, hammering all when done. Trim neatly and avoid cutting leather of upper. Don't nail down too tight; that is, allow a little play to the half-sole, or the shoe will feel tighter than comfortable. Blacken edges of sole with shoe liquid or blacking. Soak the soles in warm linseed oil to make them wear longer.

Turn a wet umbrella upside down to drain and to dry out. Place a little oil in the center of the top and into the hinges by the ferrule to prevent rusting; it will not discolor the covering.

A good black liquid polish for leather or shoes may be made from gum Arabic 4 ounces, molasses $1\frac{1}{2}$ ounces, black ink 4 ounces, strong cider vinegar 2 ounces, alcohol 1 ounce, and sweet oil 1 ounce. Dissolve the gum in the ink, add the oil, shake, then add the vinegar, then the alcohol. Keep in a corked bottle, and apply to an object with a small piece of sponge tied to a stick.

Litmus, tumeric, methyl orange, and some other substances are used for the detection of an acid or alkali. Now it has been discovered that the extract of the peel of red radishes in alcohol is even more sensitive than the other detectors.

To restore the color of faded marble wash it with a strong mixture of soap, fresh lime, and lye. Let some of the mixture, which is to be of the consistency of milk, remain on for twenty-four hours, then rinse

off with clear water, then wipe dry with a chamois skin. This usually makes the faded marble look as good as ever, or nearly so.

To prevent vapors from condensing on the window glass, as in winter, rub the glass on the inside when it is dry and warm with a little glycerine, and then rub it off with a clean rag, which will leave on a very thin film of glycerine, and this will last some time before needing renewal.

The best way to clean a new or old mirror is by rubbing it with a sponge wet with alcohol, then sprinkling on some dry indigo. After a few moments rub off with a clean chamois, and you will have a good polish.

To remove moss from brick or stonework add 2 per cent. by volume of carbolic acid to water, and apply it liberally. In a little time the moss may be removed with a broom or stiff brush and water. Repeat if necessary.

When the pictures have been taken down in order to prepare the walls for repapering, insert a tooth-pick or other suitable object into the old hole, and when the paper is hung the stick will project through the paper and then you can put back the picture nail in its place.

Rubber is injured by softening when oil gets at it. Hence wringer rolls should never be cleaned off with coal oil, as some do. Rubber hose should never be painted for the same reason. Benzine will not injure rubber. To restore elasticity to old rubber

wash it with weak ammonia-water. Ammonia is the best cleaner for wringer rolls, dirty after the wringing out of some dirty articles, like overalls. Keep rubber goods in a damp, cool place, as the cellar.

Steep ordinary blotting-paper in a solution of oxalic acid, doing this several times. Let it dry. To remove ink that has not become dry, apply the blotter, and the ink will be entirely removed. If the ink spot has become dry, moisten it before applying the blotter. Stains made by mimeograph ink may be removed by the application of strong aqua ammonia; wash and repeat until the stain is removed.

To polish lead pipe scrub it with powdered pumice-stone and a wet rag. Then wipe the pipe dry, and polish it with a dry cloth. Then at once apply a coat of white shellac varnish to protect the polished lead from the air and discoloring.

Most tiles will permit of washing with caustic soda for the removal of paint spots; but if the tile is apt to stain from the potash it will be safer to use weak ammonia-water, which may then be washed off.

Spirit thermometers are made with air in their stems. Sometimes the air will be driven from the bulb into the tube or stem so as to partly, and sometimes completely, fill the stem, leaving a vacant space in the bulb or in the stem. To mend the matter, hold the thermometer firmly at the top and swing it violently, bulb end down, and by degrees the spirit will flow back into the bulb, and the air will rise above the spirit to the top of the tube. Another way

is to place the thermometer on the stove, where the heat is gentle, or not hot enough to crack the glass, and the heat will cause the spirit to unite. This works equally well with mercury, but you must be careful not to let the glass come in contact with too hot a surface.

To make a paste for tin, to fasten labels with, add a little honey or glycerine to the paste. First see that the tin is clean. Venice turpentine, a small portion, added to paste makes a good one for tin or other metals. Don't add any acid to the paste, for that will cause the tin to rust, discoloring the label.

Make your own laundry blue. Buy a few ounces, or even a pound, though it is rather costly, in the dry powdered state. Ask for soluble laundry blue. Keep it in a tin can. Place, say a teaspoonful, in a cup and pour hot water over it, and mix with a teaspoon until all the blue is dissolved. Then pour it into a bottle through a funnel, keep it corked and where it cannot freeze in winter, and you will have the best obtainable bluing.

Small nickel-plated articles are tumbled in a revolving barrel at the factory to clean and make bright the metal, and in the barrel are placed bits of leather and rouge powder. It would appear from this that rouge would be a good powder for polishing any nickel-plated ware. Rouge is simply an oxide of iron, but is a very fine powder. The finest sort is called jewelers' rouge, and that is the kind to use when polishing metal.

To prevent rusting of steel tools rub them over with camphorated lard. Melt on the stove 1 pound of lard and add to it $\frac{1}{2}$ ounce of camphor gum. Remove the scum from it, and stir in some powdered graphite until the mass becomes the color of lead. After having rubbed the object with this, let it be for twenty-four hours, when it may be rubbed off with a dry rag.

To thread a needle easily, with the scissors cut the thread off diagonally, which will give it a thin wedge-shaped point, much easier to insert in the needle's eye.

Gummed tape-paper, used for wrapping up small store goods, is a good thing to have on hand. It comes in various sizes, but 1-inch wide is a good one, and it will find many uses around the house, such as tying small parcels, mending broken paper boxes, etc. It costs, in 1-pound rolls, about 25 cents. Makes good labels for fruit jars.

To thaw out a frozen water pipe with electricity and using an electric light current of high voltage, with a resistance arrangement to increase the heat, is quite feasible. But it can't be done with dry batteries. Run the positive wire through a bucket of water before connecting with the frozen pipe, thus increasing the amperage; the current would pass through the water, and from there to the frozen pipe, and off into the negative wire at the other end. Three or four electric lamps arranged in series could be used instead of the bucket of water, and with the same result.

To draw a waving line with a ruling pen use a rather stiff, coarse-toothed comb instead of a straight-edge; the quicker you draw the line, the smaller the waves will be.

For marking corrections in blue print strong sal soda water and a new steel pen should be used. This will make very clear white markings.

To oxidize brass and copper objects make up a solution as follows: Nitrate of iron 2 ounces, hypo-sulphite of soda 2 ounces, water 1 pint. Immerse the object in this solution and leave it until the desired depth of color is obtained.

Benzine can be deodorized with quicklime, 3 ounces to the gallon of benzine; shake it well and pour off and filter.

To waterproof concrete take of water-glass 1 part to 4 parts of water, with 1 pound of bluestone in 4 gallons of water. Mix and apply.

A good varnish for electric terminals may be made from sealing wax dissolved in gasoline; add a few drops of linseed oil to render it more flexible.

To make leather vermin-proof mix some castor oil with beef tallow and rub it well into the leather. This is specially useful for leather book bindings; insects will not eat Russian leather.

To repair a broken plaster object mix together 1 part of Portland cement, 1 part of freshly slaked lime, in a dry condition, and 1 part of fine sifted sand. Mix with water-glass of 33 degrees strength. Mix to a thick paste, and apply liberally to the

broken parts, squeezing them together until the surplus cement exudes; then, if possible, tie the parts together. The cement should harden in twenty-four hours.

To remove rust from steel and give it a polish, make up the following soap: Whiting 9 parts, oil soap 6 parts, cyanide of potassium 5 parts, and water 60 parts, all by weight. Dissolve the soap in water on the stove, add the cyanide, then add little by little the whiting. If too thick, add a little more water. Make it so that it can be run into a mold, so that when it is cold it will have the form of a cake of soap. Use this soap when you wish to clean and polish bright steel objects that have become tarnished or rusty.

To letter a lantern slide so it will show up on the screen, scratch on the inscription, using the following coating: Mix dry vegetable black with thin gum Arabic water and apply a coat with a soft hair brush, covering the surface evenly and smooth. When it is dry, scratch on the inscription with a pin, set in a wooden holder, this making the best kind of a "scratch out." For bolder effects use a quill toothpick made sharp. If in a hurry, and you want the slide at once, hold the slide over a smoky candle and coat the glass evenly all over. Then scratch the lettering on. Handle the slide with care, and put it into the lantern without the face touching the lantern sides. In the first mentioned method the slide may be protected in the usual way with a cover-glass.

Many who have a barometer do not understand it properly; simply noting the rise and fall is not all there is to it. A steady rise means that fine weather may be expected in summer, and in winter frost. A rapid rise indicates unsettled weather. Fine weather immediately after a rise must not be expected to last. A northward change in the wind often causes a rise. A fall of half a tenth or more in an hour is a sure warning of a storm. A fall with a slow thermometer foretells snow or rain. With a rising temperature, wind or rain from the south. A fall in winter indicates warmer weather; in hot weather, thunder. Fine weather may occur with a low glass, but it precedes wind or rain. The rise or fall of a barometer rather than its absolute height shows an approaching change. So the usual words, Fair, Change, etc., cannot always be depended upon. The rise from a low point indicates the close approach of gales.

Care should be taken that wooden water tanks are supported on the bottom and not on the ends of the staves. The supporting members should rest against one-fifth or more of the area of the tank base.

To remove stains from a brick mantle or chimney place, the brick being red, and the stains from soot or smoke, mix together one gallon of soft soap, 2 or 3 pounds of fine pumicestone powder, and 1 pound of liquid ammonia; make it about the consistency of stout paint. Apply with a fiber brush. After about thirty minutes rub it well with a fiber scrub-brush; the lather made from this rubbing may be removed

with water and a sponge. It may be necessary to repeat this treatment. If stains persist, then coat the bricks with a thin turpentine paint, mixed with Venetian red, in oil, and if a lighter color is required, add some yellow ochre, in oil.

To make a liquid glue that will not mold in warm weather, not become hard in the bottle, melt in a wide-mouthed jar, placed in hot water, 8 ounces of the best animal glue, with $\frac{1}{2}$ pint of warm—not hot—water. Stir and, when dissolved, add a teaspoonful of nitric acid of 36° C., until $2\frac{1}{2}$ ounces have been added; the acid must be stirred in slowly and keep stirring until the fuming has ceased; then let it cool, bottle, and keep corked.

Enameled leather carriage tops that are soiled with dust and dirt and rain should be washed off with soft water and Castile soap. Apply the water with a sponge, and then rub moderately with a stiff brush. Rinse with clear water, and dry with a soft chamois. Never apply oil or any kind of dressing without first cleaning the leather, as directed.

To clean a dirty painted wall or other soiled painted surface, cut into shavings 1 pound of good white soap and melt in 3 quarts of hot water; add 1 ounce of powdered borax and let the whole simmer. Stir it occasionally until dissolved. Apply by rubbing with a flannel cloth, cleaning off as you proceed with clear water.

To clean enamel paint first dust off carefully, then clean with this: Take very finely sifted whiting—

precipitated chalk is best—and with a damp rag gently rub the surface. First wring out the cloth in hot water, then dip into the whiting.

To kill fleas on dogs pour a little coal oil along the animal's spine, and let him go—he will rub it in by rolling over the ground. If you were to rub it in, the hair would be injured, come out most likely. It also kills dandruff and makes the hair soft and silky. The oil kills the nits or eggs. Used successfully during fourteen years.

To make a colorless shellac varnish for prints and paintings dissolve white shellac in 95 per cent. grain alcohol, the denatured article, by heat or water-bath; stir some freshly burned animal charcoal into it, bring the mass to a boil, and maintain this heat for ten minutes. Filter a small portion, and if not sufficiently clear strain through silk and then through filter-paper. A trifle of Venice turpentine will make the varnish more elastic.

The liquid used for coating airplanes is a form of celluloid varnish, containing a non-inflammable solvent called tetrachlorethane. The vapor from this solvent has a poisonous effect on the liver, hence must be used only with plenty of ventilation.

Carbolineum is a liquid used for the prevention of dry rot in timber; the wood may be brushed with it or be dipped in it. On kiln-dried wood the liquid should be applied hot; on air-dried timber it may be applied cold, especially in warm weather. Put on by brush it will cover 25 square yards of undressed timber

to the gallon. Dipping costs less for labor, being quicker, but more for the liquid.

To mend tinware, fill a bottle two-thirds full with muriatic acid, then add some zinc scraps until the acid will no longer eat it up; now drop in a small pinch of sal-ammoniac, after which fill the bottle with water. Wet the part that is to be mended with this liquid, place a sheet of zinc over the hole, with a lighted candle beneath it, which will melt the solder on the tin and cause the zinc sheet to adhere.

For stencilling on pottery the stencil plate is made from sheet-lead, this metal allowing of working in of the various irregular patterns the decoration requires. The colors may be sprayed on.

To Prevent Creosote in Chimney.—If a brick is left out at the base of the chimney when built, or removed afterward, there will be no creosote formed to trouble the walls, etc. By having an opening at the base of the chimney flue a current of air flows through, and this prevents the formation of the creosote, so-called. It may not work effectually in all cases, but in many cases it has done well.

Cleaning Motor Oil.—Take an old derby hat, remove the lining, and nail the hat, in an inverted position, to a frame which will suspend the hat above the receptacle used to catch the filtered oil. Don't use a hat that has a cracked crown or one that has ventilating holes in it. Fill the hat with the old motor oil and let it filter through the felt. The filtered oil

may be used as a machine oil, but it is of no use as a motor oil.

To Strike a Light.—Night, stranded, far from any place where a light might be obtained, and no matches! Detach one of the high-tension wires from its sparking plug and attach it to a spare plug, which let lie on any part of the frame, so that the high-tension current can earth readily. Now place in the spark-gap of the plug a piece of tissue paper, cigarette paper, dry grass, straw, previously dipped in oil. Then switch on, and turn the engine round until the high-tension current flows to the plug on the frame, when the spark, leaping the gap, will fire the oil on the prepared material and you have a fire. Of course, if you have exterior spark-gaps the ignition trick can be worked there.

One of the best home-made fire extinguishers can be made with 4 ounces of pearl ash dissolved in a bucket of water; or, better, dissolve the pearl ash in a little hot water before adding it to the cold water.

A Mold for Plaster Casting.—One of the best of the many methods used for this purpose is to take 24 ounces of glue and dissolve it in 3 quarts of water. In another vessel place 3 pounds of rosin, 6 gallons of turpentine, and the same quantity of raw linseed oil; boil all together, be careful of fire, then add best whiting until the mass becomes like putty. Take the impression while warm, allow to cool, oiling first to prevent its sticking. Another way is to boil paper

to a pulp, squeeze as dry as possible, and add an equal amount of whiting until sufficiently stiff. This makes a sort of papier-mâché. Ordinary clay is also used.

Making Photographs Transparent.—To render photographs transparent plunge them for a moment in a liquid prepared by heating 4 parts of paraffine and 1 part of raw linseed oil together. Remove it from the liquid and place it between sheets of blotting-paper under pressure, to remove excess of liquid. A picture thus prepared is to be affixed to glass.

To Fasten Paper to Glass, Etc.—Macerate in separate vessels 4 parts of gum Arabic and 1 part of gum tragacanth, each in a small amount of warm water. When the gums have softened enough they may each be stirred to form a homogeneous mass; the gum Arabic is then added to the other gum and the whole squeezed through linen, after which add a little glycerine; water may afterward be added to make right consistency. This cement will fasten parchment paper, etc., to any polished surface.

Plumbers' Cement.—A very good cement, such as is used by plumbers, may be made with 1 part of black rosin, melted, and 2 parts of powdered brick.

Hardening a Drill.—Hardening an ordinary drill in sulphuric acid makes an edge that will cut tempered steel or facilitate cutting hard rock. The acid should be poured into a flat-bottomed vessel to the depth of about $\frac{1}{8}$ inch. Heat the point of the drill to a dull cherry red and dip into the acid to the depth stated.

If the point should break, it can be rehardened, but with a little less acid in the vessel.

How to Make the Fire.—The usual and wrong way is to place a lot of paper on the grate and then throw in the wood, but the right way is in this manner: Place the paper rather loosely on the grate, then place the kindling wood in a sloping position, not flat; this forms a funnel for the free passage of the blaze and smoke, and for the air, the most important thing of all. You will find that less kindling is required in this way, and that you will get a quicker and hotter fire. If a hard-coal fire is desired, then after the wood fire has made a good foundation, lay some pieces across the grate, to prevent the fresh coal from going through. If soft or bituminous coal is to be used, then lay the pieces with the grain of the coal running across, as the flame travels more slowly across than upward.

To Keep Out Rats.—The following is a sure cure. In a dwelling house the rat holes are usually found where the floor joins the walls. Find the holes and pour into and around each plenty of pine tar (not coal-tar). Inside of two days the rats will all be gone, nor will you be bothered with them if you will now and then place some more tar around the holes. The tar will get hard in time. A 2-quart can will last ordinarily a year, and it is a cheap substance.

Blue-prints may be made from the typewritten sheet. Write the matter out on the machine, putting a sheet of carbon paper in back of the sheet to give

the printing density on both sides of the paper, then proceed with the blue-prints in the usual manner. Use onion-skin manifolding paper. For white prints use new carbon paper and make the prints from that, in which case the letters will appear on a white ground. The carbon paper is more expensive than the white paper.

It is not necessary to use cream in making ice-cream of the best kind. Try this: To a quart of skimmed milk use 1 pound of granulated sugar and the yolks of 5 eggs, with any desired flavoring. Heat the milk in a porcelain-lined or aluminum vessel, heat slowly, and when it comes to a boil skim and add the sugar, then remove from the fire. After placing the milk on to heat it should be stirred until it boils. After adding the sugar stir with a wooden paddle until the sugar is melted. Have the egg yolks well beaten with some warm milk. Then add it to the other milk, stirring all the time. Place the milk can in a tub with broken ice around it until cool, stirring it meanwhile. Stir in the flavoring, then place in the ice-cream freezer. Some think this ice-cream better than that made in the ordinary manner. The whites of the eggs may be used for icing.

You get many unsealed envelopes the gummed flaps of which may be used for labeling fruit jars and jelly glasses, etc. Cut off the gummed flap and place in an envelope and have handy when you need the labels. Cut to a proper size and with ink write on the name of the fruit or what not.

When gasoline or benzine is used for cleaning anything a few drops of cedar oil added to the last rinsing of the fluid will greatly hide the odor.

How to Thread a Needle.—The usual way is by first preparing the thread, unwinding any desired length from the spool, then either cut it off with scissors or break by a quick or steady pull, all of which depends upon the strength of the cotton. Then in order to make the end go through the needle's eye it is pulled through the teeth, which removes some of the cotton fibers and leaves enough to guide the thread through. The new way is to cut the thread with the scissors, not across, but in an oblique direction—bias, women would call it. You will be surprised how easily the end will then go through.

To give bronze the green stain of verdigris cover the parts that are to be discolored with ground horseradish saturated with vinegar; keep the horseradish wet with the vinegar until the stain is fixed. This may take some days, though the stain will show much sooner than that, but will not be permanent unless left on long enough. Usually three or four days will suffice.

When the water in a well gets low, as in a time of drought, clean it out and place in it some lumps of fresh lime, which will purify the water when it flows in, and make it sweet and wholesome thereafter for some time. It is a good plan to clean out a well occasionally.

When setting fence-posts lay the top soil aside,

and when you fill in shovel in the top soil first. Ram the earth well, especially the top. As a post rots at the earth line only, the poor bottom soil will prevent it longer than the richer top soil.

Have a can of wood tar handy if you are a farmer. It is good for the horses' hoofs, for the hands in corn-husking time, good for the sheep, on their noses and hoofs, heals sores on animals, keeps away buffalo gnats, promotes growth of bark on trees, keeps away insects, preserves ropes, seines, and steel cables. Water left standing on wood-tar is good for weak lungs or chests. It is quite inexpensive and never spoils.

To paint a coal-tar-covered pipe apply a coat of copal varnish, and before it is quite dry give it a dusting of bronze powder or powdered aluminum. The tar will discolor any paint over it.

To keep linoleum bright wash it clean and when dry give it a coat of good floor varnish. Or rub the linoleum once a week or so with palm oil. This oil softens and preserves the cloth, but a coat of good copal varnish once a year is best.

There is nothing better than liquid ammonia as a fire extinguisher if you can get at the fire when it starts. Carbonic acid gas is the next best extinguisher, but ammonia is cheaper. Table salt liberally applied is good when the chimney gets afire. It will generate a gas that smothers the flame.

To make oil-cloth, make up a solution of soft soap, and apply a coat of it to the cloth while hot;

when dry give it a coat of hot alum-water; when this dries apply the paint, one containing a fine pigment and thinned with raw linseed oil and turpentine, with plenty of drying japan. When the paint is dry finish with a coat of thin copal varnish. The painted and varnished cloth should then be subjected to a temperature of 200° F. This is about the heat of an oven for baking bread.

To clean smoke, dirt, grease, fly specks, etc., from a ceiling make a mixture of vinegar and baking soda, with a little table salt, and rub the spots with it. After cleaning the surface wash off with warm water and soap; wipe dry with a soft rag. This is good also for enameled baths, for glass, and white porcelain.

To fumigate a room take $\frac{1}{4}$ pound of potassium permanganate and 1 pound of formaldehyde. Place the former in a small pan, which should rest on some bricks, and then put in another pan the formaldehyde; now, having sealed up all cracks and openings in the room, pour the formaldehyde into the other liquid, and get out of the room at once, closing the door tight behind you. Keep the room closed for twenty-four hours. This will exterminate all germs and insects. Be careful with it, and when opening the room to ventilate it.

To keep chamois skin or kid gloves soft after washing them with soap, let some of the soap remain in afterward, and hang out to dry.

Pulverized rottenstone moistened with sweet oil

is one of the best cleaners of brass or copper. Apply rather briskly and polish with a chamois or soft rag, flannel being best. It is also well to rub the part that has been rubbed with rottenstone with some whiting on a rag.

For marking tools try bluestone (copper sulphate) and table salt, equal parts, dissolved in water. I have used this for years with success. I find that nitric acid does not always answer for etching on steel.

A little saltpeter added to glue while cooking will deodorize it; it will also cause the glue to dry quicker and harder.

Marble or stone may be polished by first smoothing it with sand and water, using a stone rubber, after which it may be polished by rubbing with putty powder and weak acid. Use a flannel-covered buffer. Putty powder is tin oxide.

A cheap fireproofing material for wooden roofs is hot coal-tar, two coats, sprinkling fine sand on the second coat.

To preserve drawings, whether pencil, lithographic, or water color, float in a bath of pure new milk; then quickly pull the drawing up by one corner, pin to a board at one corner, and allow it to drain. When it is dry the milk will give a waterproof film that may be sized and varnished.

To clean a moldy wall first wash off with a weak solution of chloride of lime. Mildew may be removed with alcohol.

Slight scratches on window-glass or plate-glass may often be removed by rubbing it with a pad of raw cotton charged with fine jewelers' rouge.

To remove stains from a garment a woman advises rubbing with raw potato, slicing to a fresh surface as required. If any marks remain, sponge lightly with alcohol.

To remove stains from silverware and gold immerse in a solution of $\frac{1}{2}$ ounce of potassium cyanide to 1 pint of water. Let it remain in this for some time. Then brush off with prepared chalk.

To hold a tack where it is done with difficulty in the holding, stick it in a slip of paper, and hold it thus where you wish it, and hammer it in.

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